Statistical Methods of Determination of Effective Parameters of the Observed Convective Currents

The concentration of N_1, i.e. the number of circles per unit of surface, can be expressed by the Eq.(10) where n is the number of currents crossed by an aircraft taking temperatures along the path L .
b) In the case of air bubbles, apart from their shape, it is necessary to consider the question of their spatial distribution. This can be expressed as a distribution of the ellipsoids (11) and (12) with their concentration. The probability of horizontal cross-sections of the ellipsoids having the dimensions from l to $l + dl$ will be Eq.(13). The conditional probability (14) is equal to the ratio of the elliptic rings (having axes a_1 and a_1/m with thickness da_1) to the surface of the ellipse (having axes a and a/m). If Eq.(15) is the density probability function of the ellipsoids distribution and N_2 the number of the ellipsoid centres per unit of the volume, the equation (16) is the number of ellipsoids along the horizontal straight line (a^2 = the second moment). From Eqs.(17) and

Statistical Methods of Determination of Effective Parameters of the Observed Convective Currents

(14) substituted into Eq.(13), an integral equation (18) can be formed which expresses the relationship between the distribution of the ellipsoids and the chords. The solution for this equation is given by (19).
The concentration of ellipsoids N_2, i.e. their number per unit of volume, according to Eq.(16) can be expressed as Eq.(20), where n = total number of ellipsoids along the path L.
It should be noted that the Eq.(18) contains no reference to m. Therefore, it can be applied to all shapes of the air bubbles, such as sphere ($m = 1$), vertical ellipsoid ($m < 1$) or horizontal ellipsoid ($m > 1$).
3) A relative surface S of the air current at any cross-section is expressed by Eq.(21) where $\bar{s}^2$ = second moment. The value of S can be obtained from the observations.
By multiplying both parts of Eq.(8) by l and integrating for l, the Eq.(22) is obtained ($\bar{l}$ = mean chord).
The number of ellipsoids (23) on a horizontal surface (cross-section) can be calculated from Eqs.(3) and (5) where

Statistical Methods of Determination of Effective Parameters of the Observed Convective Currents

$\bar{a}$ = mean length of the horizontal axes. The density of ellipsoids intersecting a surface u(a) is Eq.(24). The probability of obtaining the circles of diameters from s to s + ds on the intersected surface is Eq.(25) and the conditional probability of the surface being formed by cutting an ellipsoid at the distance from its centre y to y + dx will be Eq.(26). From Eqs.(26) and (24) substituted into (25), the equation (27), expressing the distribution of circles on a horizontal surface is formed. It is assumed that a surface under consideration represents the surface of flight. Then, taking Eq.(28) instead of $F_2(a)$ in Eq.(19) and $N_1 = N_2\bar{a}/m$ from Eq.(23), an equation (29) is obtained. This is the same as (9), thus (30) is being formed, which indicates that the relative surface of the ascending air in both cases can be determined by Eqs.(21) or (22). Also, it is evident from Eq.(30) that the distribution of circles on a horizontal surface is independent from the kind of air convection, The relative volume V of the air bubbles can also be

Statistical Methods of Determination of Effective Parameters of the Observed Convective Currents

shown as Eq.(31), where $\bar{a}^3$ = third moment. In this case, the relative volume of the convective current is equal to the relative surface of any horizontal cross-section.

4) The equations can be applied in the cases of air being either stationary or in motion with winds gradually varying with height. In the latter case, the convective currents will be of an inclined elliptic shape. But their cross-section will be represented as a circle. Therefore, the Eqs.(9) (10) and (21) (22) can be applied. Similarly, Eqs.(14) and (19)(20) can also be applied for the air bubble in these conditions.

5) In order to determine the statistical relationship between the dimension and the temperature of the convective current, it is necessary to consider their joint distribution, i.e. to solve a question with the two independent variables.

In the case of air bubbles, the probability of the horizontal cross-section of ellipsoid having a given rate of the temperature increase is calculated by Eq.(32).

Statistical Methods of Determination of Effective Parameters of the Observed Convective Currents

This equation can only be solved when the temperature condition (33) is satisfied. Therefore, Eq.(34) will be integrated in respect of one variable only. If the internal temperature of the ellipsoid changes according to Eq.(36), then Eq.(37) will be obtained. Here, ℓ and T are two independent variables with T included in the integral as a parameter. By introducing a new variable, c (38), the Eq.(37) will change into (39), where c can be considered as a parameter. After both parts being differentiated in respect of ℓ, the function (40) or (41) is obtained.
In the case of the airstream, the temperature change will follow Eq.(42) and the above probability will be expressed by (43), which can be written as (44), where $T_{o,s}$ is the internal temperature varying according to Eq.(45). By the inclusion of Eq.(45) into F_2 in Eq.(44), the form (46) is obtained, which can be written as Eq.(47). Assuming that the profile of the temperature distribution (48) represents a circle, the Eqs.(49) and (50) will be

obtained. These are solved by substituting the variable by $T = c\ell$ in Eq.(51) in order to obtain the final solutions (52) and (53).

6) If more variables are included which could represent a number of conditions in the interior of ellipsoids or circles, the Eqs.(54) to (59) will be necessary. The previously derived Eqs.(8), (18), (37),(43),(49),(50 and their solutions (9),(19),(40),(46),(52),(53) can be treated as the particular cases of (54) and (55) with the solutions (58) and (59).

7) As it was shown before, it is possible to consider the distribution of circles or ellipsoids grouped according to their dimensions and the central temperatures instead of the distribution of chords. In order to do that, Eqs.(60) and (61), formed from (8) and (18), should be introduced, then Eq.(62) will be found. In the case of two independent variables, as it may occur when the temperature changes according to Eqs.(36) or (42), the required distribution will follow the Eqs.(63) to (66). Taking the

temperature changes (48) instead of (63) and (64), the Eqs.(67) and (68) will be derived with the limits similar to Eqs.(65) and (66).
8) The Eqs.(9),(19),(40),(46),(52) and (53) express the distribution based on the functions $w(l)$ or $w(l, T)$ found experimentally from a great number of flights. However, a simpler method can be applied for calculation of two or more independent variables.
Eqs.(37) and (43) with the substitution (38) or Eqs.(49) and (50) with (51) are transformed independently of the variables l and c. In particular, the Eq.(43) will be obtained in a form (69). Denoting the number of the simultaneous observations as $f_{k+0.5;i+0.5}$, the Equations (70) and (71) are formed. By changing the succession of integration of the last two integrals and by integrating in respect of l, the Eq.(72) will be obtained.
The second integral can be presented in the form of Eq.(73) and instead of (72), a system of algebraic equations (74) to (76) can be used with the coefficients being independent

of k . If Eqs.(49) and (50) are included, these equations become (77) and (78).

The equations of the type (74) are easy to evaluate. The evaluation of (74) and (75) with the coefficients is shown in Tables 1 and 2. The tables show the distribution of dimensions at an interval c which was taken from the Eqs.(79) and (80). The data from the tables can be considered as having only one independent variable, i.e. the index k+0.5 being omitted.

9) As an example, the data of 5 flights over the Ukraine in June, 1956, is given. The total time of the flights was 10 - 13 hours at heights ranging from 10 - 50 m to 1 500 - 2 000 m. The majority of observations were made at 300 - 500 m (Table 2).

Figure 1 shows the probability density functions of the following distributions: chord dimension $w(\ell)$, circle dim. $F_1(s)$, horizontal axis of ellipsoid $F_2(a)$.

Figure 2 represents the probability density functions of two independent variables of the following distributions:

Statistical Methods of Determination of Effective Parameters of the Observed Convective Currents

chord dimension and temperature $w(l, T)$ (the upper graph), circle diameter and temperature $F_1(s, T_o)$ (the middle graph), horizontal axis of ellipsoid and temperature $F_2(a, T_o)$ (the lower graph).

There are 2 figures and 2 tables and 9 references, 5 of which are Soviet, 3 English and 1 French.

ASSOCIATION: Akademiya nauk SSSR Institut prikladnoy geofiziki (Institute of Applied Geophysics, Ac.Sc.USSR)

SUBMITTED: December 23, 1957

Card 11/11

1. Atmosphere--Motion 2. Clouds--Development
3. Convection--Analysis 4. Mathematics--Applications

VUL'FSON, N.I., Doc Phys-Math Sci -- (diss) "Study of convective movements in the free atmosphere." Mos, 1959. 14 pp (Acad Sci USSR. Inst of Applied Geophysics). 225 copies. List of author's works at end of text (10 titles) (KL, 37-59, 105)

3 (8)

AUTHOR: Vul'fson, N. I. SOV/20-126-6-27/67

TITLE: On the Mechanism of Turbulent Instability ~~Lease~~ in the Free Atmosphere (O mekhanizme razrusheniya neustoychivosti v svobodnoy atmosfere)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 6, pp 1244 - 1247 (USSR)

ABSTRACT: In recent years a method was developed of announcing convective rising airflows by the aid of sensitive thermometers. The temperature distribution in the flow is determined by statistical integration of the measuring results. The distribution function (1) and the temperature profile (3) of the flow are given. Measurements reveal that the temperature distribution profile varies but little with altitude; figure 1 shows a graph depicting the variation of temperature in the center of the flow with altitude. Formula (4) describes the temperature drop in the axis of flow. Next, equations (5) and (6) are given for the temperature- and velocity variations in the axis of turbulent flows. These equations are expanded for any arbitrary point in the flow (9) (10). Results reveal that dimensions of convective flow systematically decrease with rising instability and turbu-

Card 1/2

On the Mechanism of Evacuation of Instability Lease SOV/20-126-6-27/67
the Free Atmosphere

lence of atmosphere. Furthermore, it follows that instability evacuates in free atmosphere in the form of a spontaneous convective flow. There are 2 figures, 2 tables, and 9 references, 5 of which are Soviet.

ASSOCIATION: Institut prikladnoy geofiziki Akademii nauk SSSR (Institute of Applied Geophysics of the Academy of Sciences, USSR)

PRESENTED: February 16, 1959, by L. I. Sedov, Academician

SUBMITTED: February 11, 1959

Card 2/2

PHASE I BOOK EXPLOITATION SOV/5682

Vul'fson, Naum Isaakovich

Issledovaniye konvektivnykh dvizheniy v svobodnoy atmosfere . (Investigation of the Convective Motions in the Free Atmosphere) Moscow, Izd-vo AN SSSR, 1961. 251 p. Errata slip inserted. 1,500 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut prikladnoy geofiziki.

Resp. Ed.: I. A. Kibel', Corresponding Member, Academy of Sciences USSR; Ed. of Publishing House: G. G. Gus'kov; Tech. Eds.: T. A. Prusakova and G. N. Shevchenko.

PURPOSE : This book is intended for scientific workers in physics of the atmosphere and certain related fields (e.g., aviation and atmospheric pollution control). It may also be used by students in meteorological institutes and faculty members of university departments of physics.

Card 1/7 1/3

Investigation of the Convective (Cont.) SOV/5682

COVERAGE: The book presents results of an investigation of convective motions in the free atmosphere and in cumulus clouds. A large portion of the book is devoted to substantiating the observational precedures and instrumentation of aircraft flights required for acquiring the basic data, and methods of processing, studying, and statistically interpreting the observational results. Basic convection parameters and their variation with changing physicogeographical conditions, the mechanism for the development of convective motions in the free atmosphere, and the association between convective motions within and without clouds can be established from the data presented. The obtained results are valuable for understanding the mechanism of convection and the development of convective clouds and for their possible uses as quantitative indices of phenomena associated with convective motions. The author thanks Academician Ye. K. Fedorov (scientific advice); V. V. Shchelokov, V. I. Skatskiy, A. M. Gromov (design of apparatus): N. V. Davydkin and I. S. Pavlova (installation and operation of apparatus); A. I. Korzhov, V. N. Shlyakov (deceased), P. N. Radkevich

Card 2/13

and N. S. Kolesov (commanders of flight crews); V. M. Bovsheverov, L. M. Levin, I. A. Kibel', Corresponding Member AS USSR, A. M. Obukhov, Corresponding Member AS USSR, A. Kh. Khrgian, Professor, and N. Z. Pinus, Doctor of Physics and Mathematics (critical remarks); S. V. Pshenay-Severin (editorial assistance). There are 149 references: 61 Soviet, 70 English, 9 German, 8 French, and 1 Polish.

TABLE OF CONTENTS:

VUL'FSON, N.I., doktor fiz.-matem. nauk, otv. red.; LEVIN, L.M., doktor fiz.-matem.nauk, otv. red. Prinimali uchastiye: KOMAROV, N.N., red.; PSHENAY-SEVERIN, S.V., red.; UGAROVA, K.F., red.; NIKOLAYEVA, L.K., red. izd-va; BERKGAUT, V.G., red. izd-va; VOLKOVA, V.V., tekhn. red.

[Study of clouds, precipitation, and thunderstorm electricity; reports] Issledovaniia oblakov, osadkov i grozovogo elektrichestva; doklady. Otv. red. N.I.Vul'fson, L.M.Levin. Moskva, Izd-vo Akad.nauk SSSR. 1961. 327 p. (MIRA 15:1)

1. Mezhvedomstvennaya konferentsiya po voprosam issledovaniya oblakov, osadkov i atmosfernogo elektrichestva. 6th, 1959.
(Cloud physics—Congresses)

VUL'FSON, N.I.

Irregularities of the atmospheric refractive index in the radio frequency region caused by convective motions. Izv. AN SSSR. Ser. geofiz. no.1:141-149 Ja '61. (MIRA 14:1)

1. Akademiya nauk SSSR, Institut prikladnoy geofiziki.
(Refraction) (Radio waves)

L 14977-63 EWT(1)/BDS AFFTC/ASD/ESD-3 RB

ACCESSION NR: AP3005438 S/0020/63/151/005/1089/1092

AUTHOR: Vul'fson, N. I. 18 55 54

TITLE: Influence of air humidity on the development of convection in a cloudless atmosphere

SOURCE: AN SSSR. Doklady*, v. 151, no. 5, 1963, 1089-1092

TOPIC TAGS: humidity, humidity field, atmospheric convection, humidity nonhomogeneity, water vapor, convection, thermal convection, vapor transport

ABSTRACT: Under certain conditions air humidity is more important than temperature in the development of atmospheric convection. In-flight measurements were made over the Black Sea in August 1962 with a low-inertia thermometer, a sensitive automatic dew-point hygrometer, and an accelerometer. Flights were made in the daytime in cloudless and almost windless weather. At heights of 25—50 m above the water surface, the instruments detected humidity nonhomogeneities which differed as much as 2.0—2.5 mb from the relatively uniform humidity background. Stratification of the lower layers of the air was virtually neutral. The convection phenomenon in the humidity field appears to be an important

Card 1/2

L 14977-63
ACCESSION NR: AP3005438

factor in a number of problems of atmospheric physics. For example, water vapor evaporating from the surface of the seas and oceans is transported upward primarily by convection resulting from the instability of the lower air layers. In the winter and during summer nights, when the water is warmer than the adjacent air layers, vapor is transported by thermal convection; during daytime in summer, when there is a thermally neutral or even weakly stable stratification, vapor is transported by convection associated with the humidity field. The article was presented by Academician Ye. K. Fedorov on March 15, 1963. Orig. art. has: 1 figure and 16 formulas.

ASSOCIATION: Institut prikladnoy geofiziki Akademii nauk SSSR (Institute of Applied Geophysics, Academy of Sciences SSSR)

SUBMITTED: 13Mar63 DATE ACQ: 06Sep63 ENCL: 00

SUB CODE: AS NO REF SOV: 007 OTHER: 002

Card 2/2

VUL'FSON, N.I.; GUSAK, N.A.; SKATSKIY, V.I.

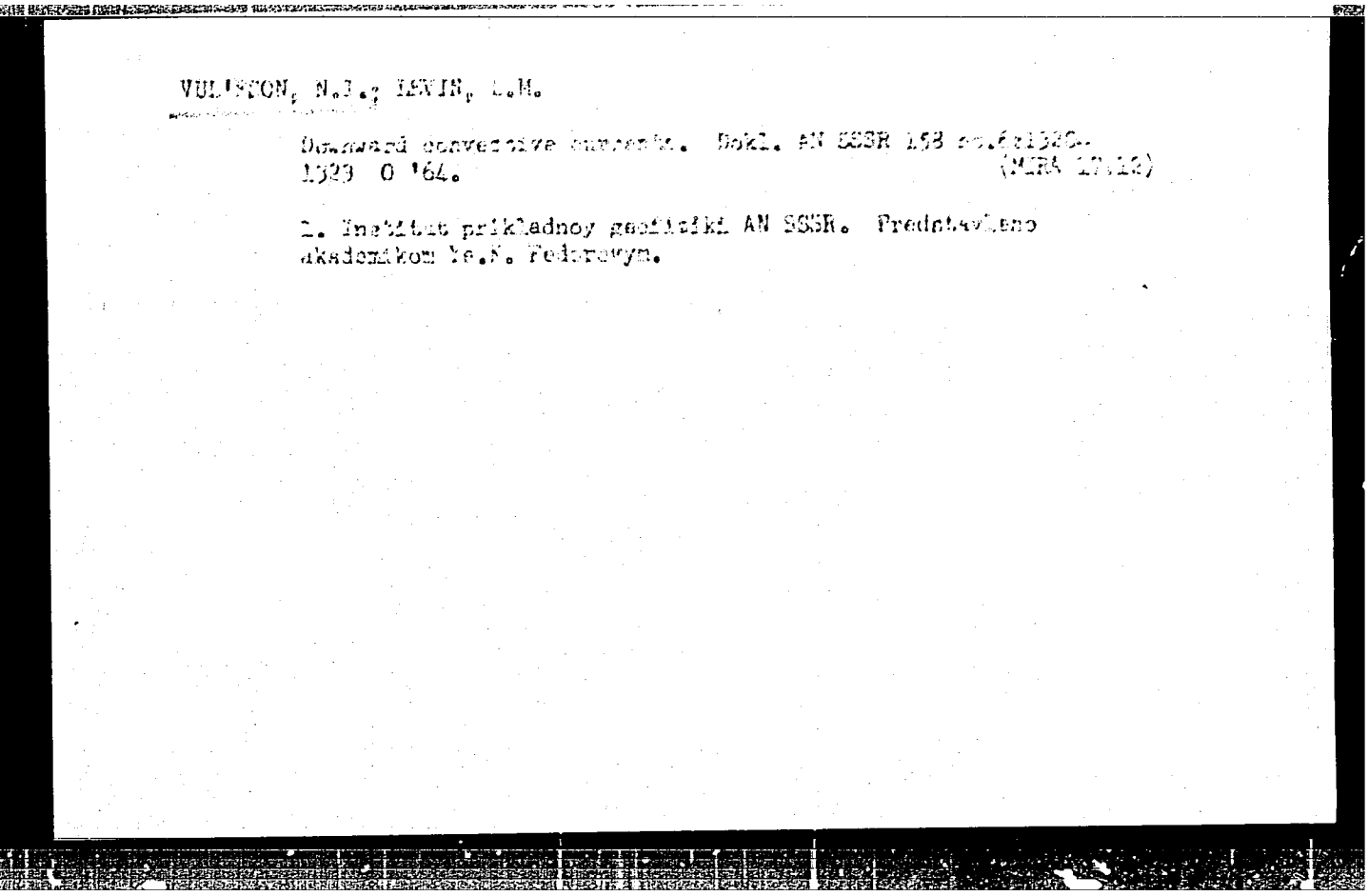
Relation of microstructure parameters to convective motions in clouds. Izv. AN SSSR. Fiz. atm. i okeana 1 no.1:76-83 Ja '65. (MIRA 18:5)

1. Institut prikladnoy geofiziki AN SSSR.

VUL'FSON, N.I.; IVANOV, V.N.

Structure of the temperature field in cumuli. Dokl. AN SSSR 159 no.4:786-788 D '64 (MIRA 18:1)

1. Institut prikladnoy geofiziki AN SSSR.



VUL'FSON, N.I.; IRVIN, L.N.

Downward convective currents. Dokl. AN SSSR 153 no.6:1320-1323 O '64. (MIRA 17:12)

1. Institut prikladnoy geofiziki AN SSSR. Predstavlena akademikom Ye.K. Fedorovym.

VUL'FSON, N.I.; GUTMAN, L.N.; PAVLOVA, I.S.

Effect of gravitation waves on the formation of hail clouds in a mountainous area. Meteor. i gidrol. no.1:23-29 Ja '64. (MIRA 17:3)

1. Institut prikladnoy geofiziki AN SSSR i Vysokogornyy geofizicheskiy institut.

ACCESSION NR: AP4010573 S/0050/64/000/001/0023/0029

AUTHORS: Vul'fson, N. I.; Gutman, L. N.; Pavlova, I. S.

TITLE: Effects of gravitational waves on the formation of hail clouds in mountainous regions

SOURCE: Meteorologiya i gidrologiya, no. 1, 1964, 23-29

TOPIC TAGS: gravitational wave, hail cloud, cumulus cloud, wind velocity, temperature gradient, precipitation, hail

ABSTRACT: The authors' purpose is to examine the conditions under which the effects of gravitational waves may lead to the formation of vertical movements sufficiently intense to have a noticeable influence on the development of hail clouds. They consider the model of an infinitely long mountain range of arbitrary cross section and with transverse wind of constant velocity. They derive equations for air movement and compute values for different heights and breadths of the mountains. These computations show that wave forms developed by a mountainous zone may lead to the formation of strong, stationary, ascending movements of air. To test this, they investigated the relationship between development of hail in the Alazani valley and fields of temperature and wind favorable for producing atmospheric waves. For completeness and comparison they also examined temperature

Card 1/2

ACCESSION NR: AP4010573

and wind fields associated with cumulus rain clouds not producing hail as well as fields associated with cumulus clouds yielding no precipitation at all. The relationship of precipitation to wind and to temperature gradient is illustrated by Fig. 1 on the Enclosure. For winds blowing parallel to the range, regardless of temperature gradient, the weather was fair (for the four years represented by the data of Fig. 1). All kinds of clouds were observed for winds blowing at right angles to the trend of the range, but hail was more likely the nearer the wind direction was to this right-angle direction, and the higher the temperature gradient was. This means that hail is most probable under conditions most favorable for the development of gravitational waves. Orig. art. has: 3 figures and 15 formulas.

ASSOCIATION: Institut prikladnoy geofiziki (Institute of Applied Geophysics); Vy*sokogorny*y geofizicheskiy institut (High-Mountain Geophysical Institute)

SUBMITTED: 00	DATE ACQ: 14Feb64	ENCL: 02
SUB CODE: AS	NO REF SOV: 002	OTHER: 002

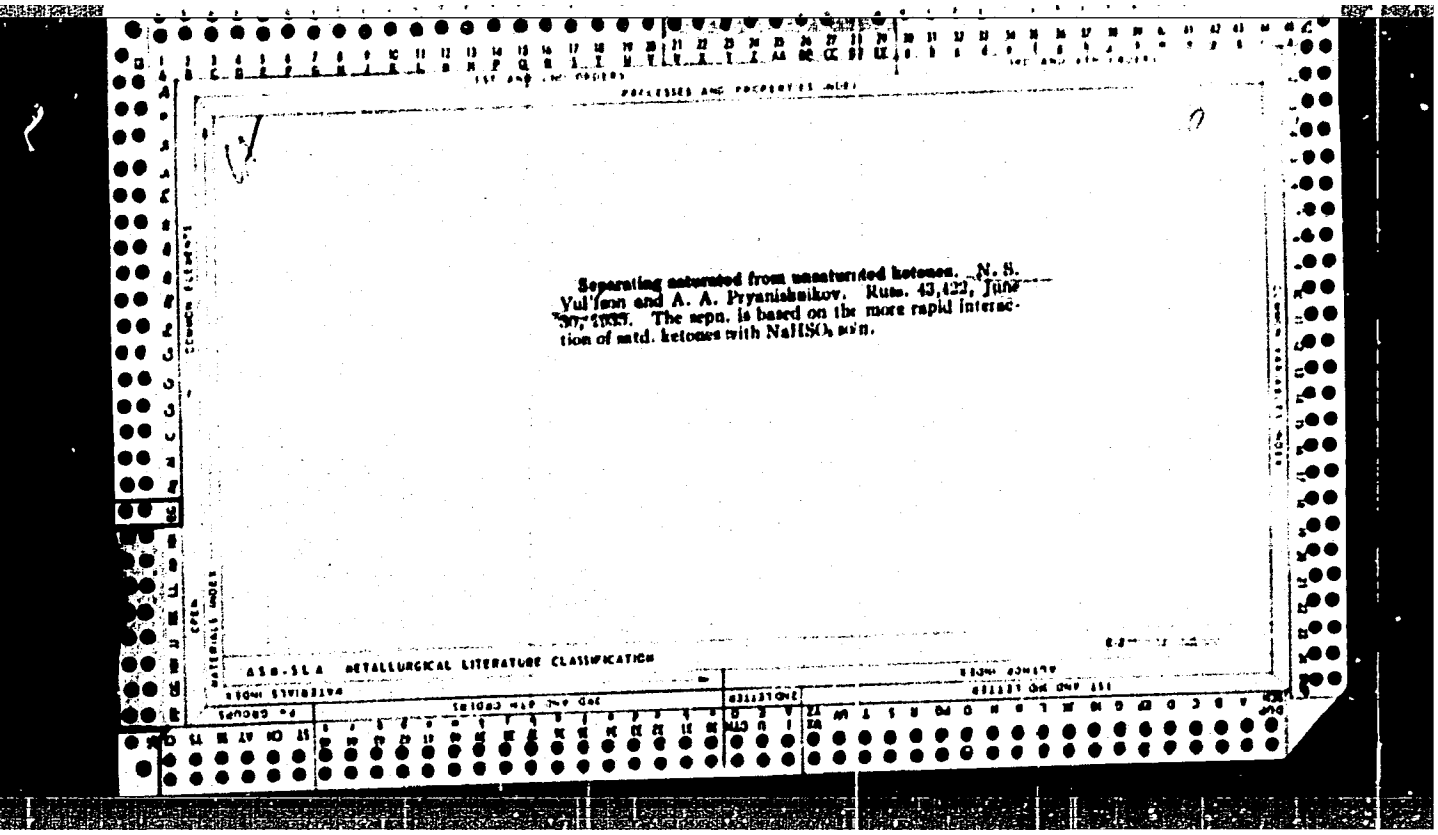
Card 2/2

VUL'FSON, N.I.

Effect of humidity on the development of convective movements in a cloudless atmosphere. Dokl. AN SSSR 151 no.5:1089-1092 Ag '63. (MIRA 16:9)

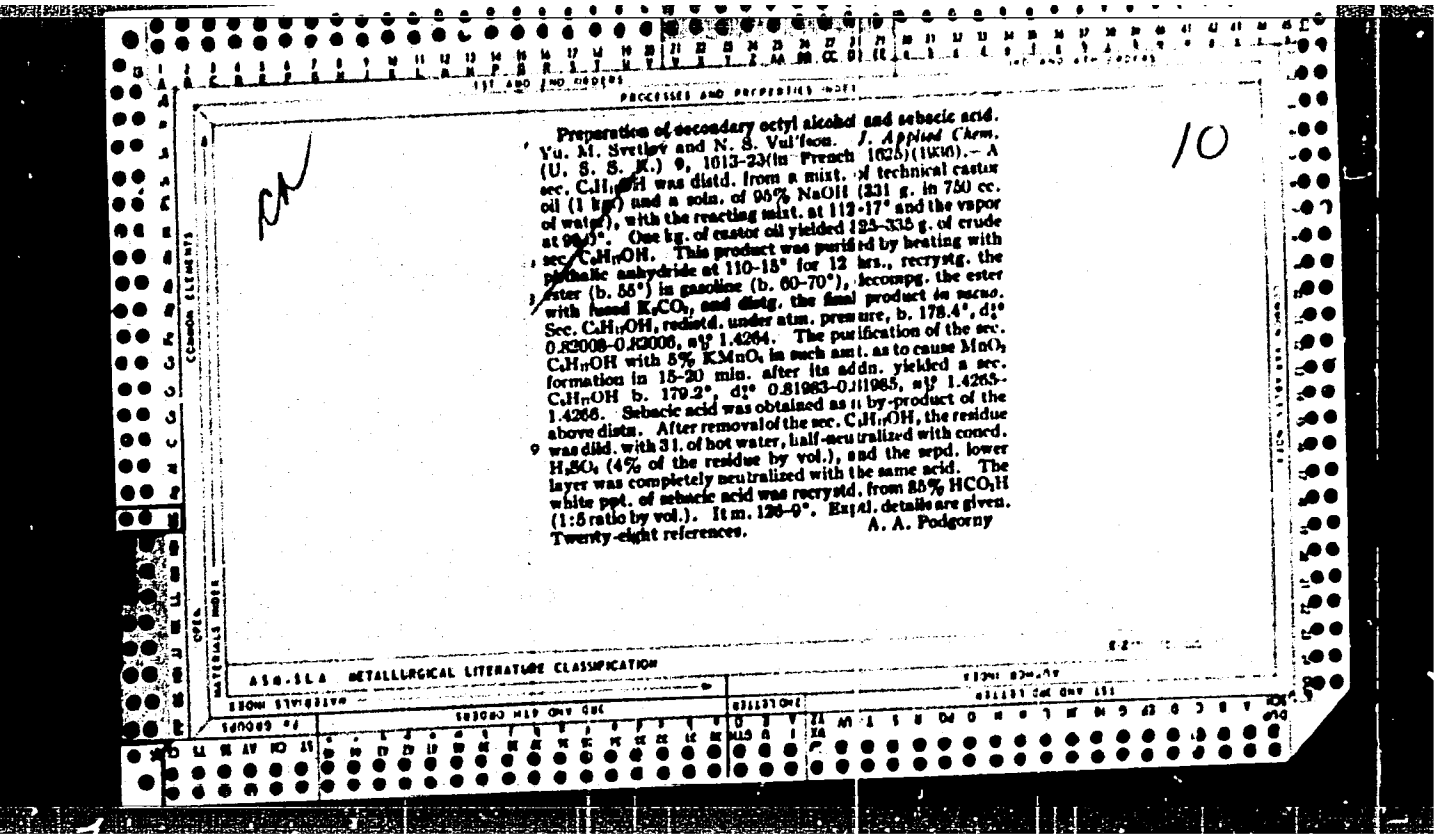
1. Institut prikladnoy geofiziki AN SSSR. Predstavleno akademikom Ye.K.Fedorovym.

(Humidity) (Atmosphere)

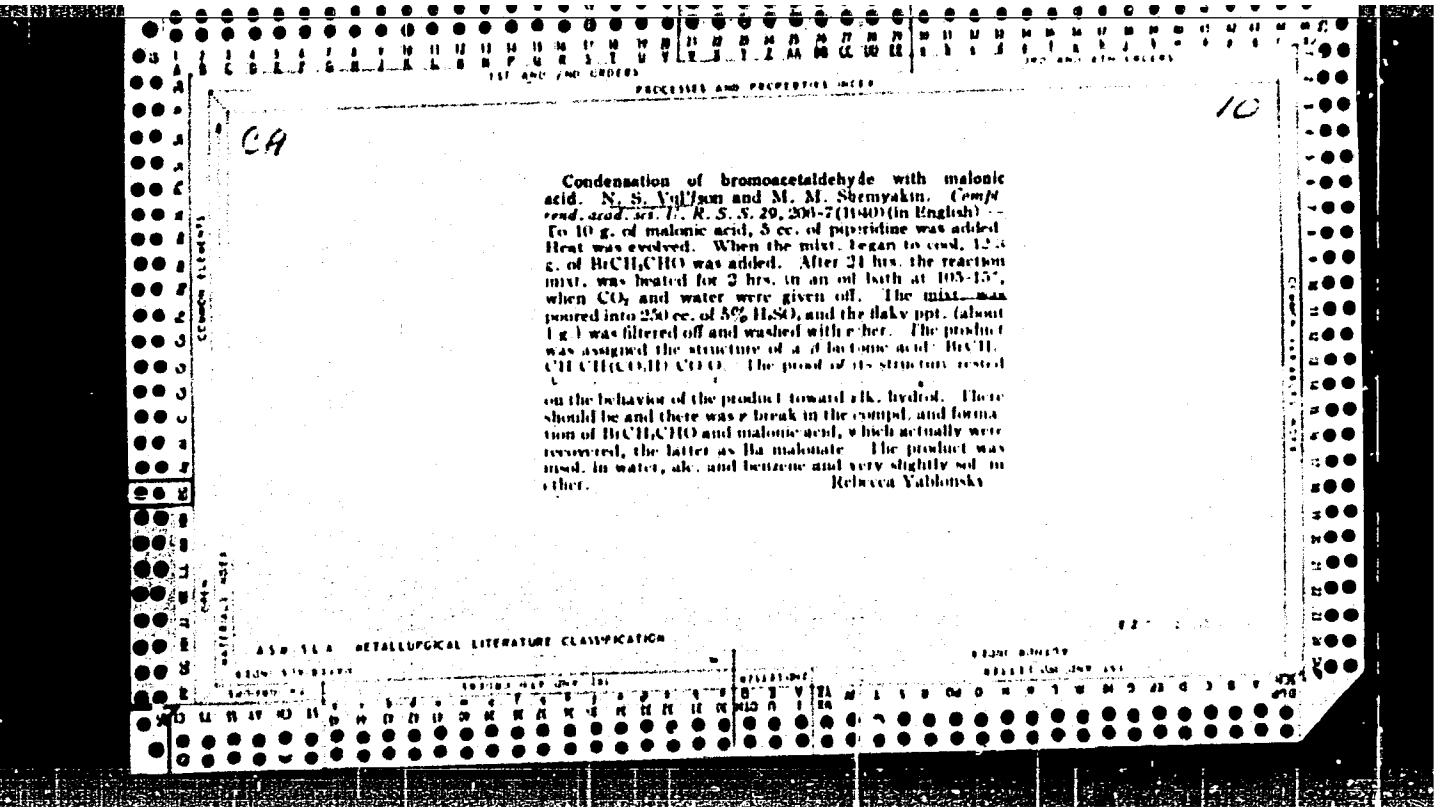


Separating saturated from unsaturated ketones. N. S. Yul'fson and A. A. Pryanishnikov. Russ. 43,422, June 30, 1957. The sepn. is based on the more rapid interaction of satd. ketones with $NaHSO_3$ soln.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION



Preparation of secondary octyl alcohol and sebacic acid. Yu. M. Svetlov and N. S. Vul'fson. *J. Applied Chem.* (U. S. S. R.) 9, 1013-23(In French 1025)(1936).— A sec. $C_8H_{17}OH$ was distd. from a mixt. of technical castor oil (1 kg.) and a soln. of 95% NaOH (331 g. in 750 cc. of water), with the reacting mixt. at 112-17° and the vapor at 99-100°. One kg. of castor oil yielded 125-335 g. of crude sec. $C_8H_{17}OH$. This product was purified by heating with phthalic anhydride at 110-15° for 12 hrs., recrystg. the ester (b. 55°) in gasoline (b. 60-70°), decomps. the ester with fused K_2CO_3, and distg. the final product *in vacuo*. Sec. $C_8H_{17}OH$, redistd. under atm. pressure, b. 178.4°, d_4^{20} 0.82008-0.82000, n_D^{20} 1.4264. The purification of the sec. $C_8H_{17}OH$ with 5% $KMnO_4$ in such amt. as to cause MnO_2 formation in 15-20 min. after its addn. yielded a sec. $C_8H_{17}OH$ b. 179.2°, d_4^{20} 0.81983-0.81985, n_D^{20} 1.4265-1.4266. Sebacic acid was obtained as a by-product of the above distn. After removal of the sec. $C_8H_{17}OH$, the residue was dild. with 3 l. of hot water, half-neutralized with concd. H_2SO_4 (4% of the residue by vol.), and the sepd. lower layer was completely neutralized with the same acid. The white ppt. of sebacic acid was recrystd. from 85% HCO_2H (1:5 ratio by vol.). It m. 126-9°. Exptl. details are given. Twenty-eight references. A. A. Podgorny



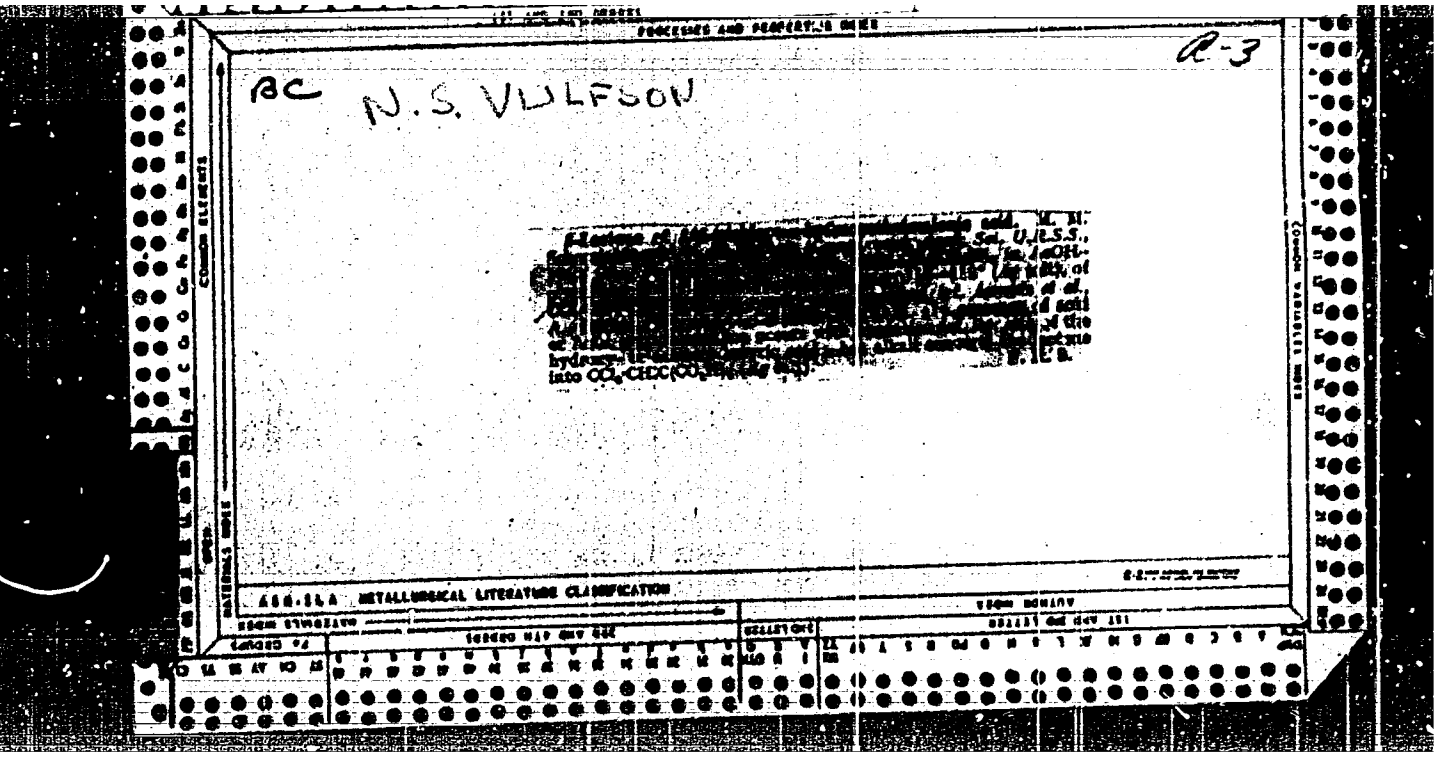
CA

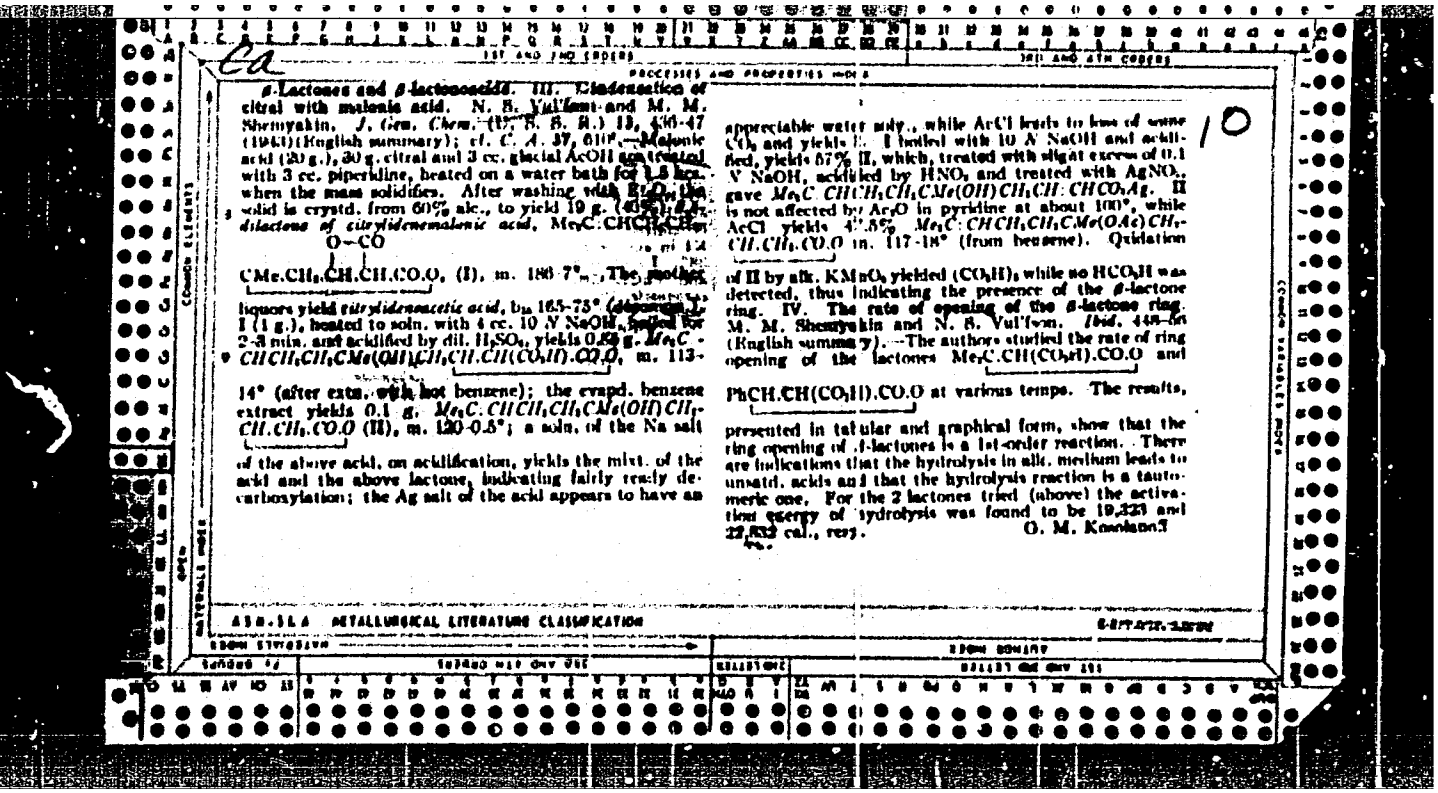
10

Condensation of bromoacetaldehyde with malonic acid. N. S. Vul'fson and M. M. Shemyakin. *Compt. rend. acad. sci. U. R. S. S.* 29, 200-7 (1940) (in English). — To 10 g. of malonic acid, 5 cc. of piperidine was added. Heat was evolved. When the mixt. began to cool, 12.5 g. of $BrCH_2CHO$ was added. After 24 hrs. the reaction mixt. was heated for 2 hrs. in an oil bath at 105-15°, when CO_2 and water were given off. The mixt. was poured into 250 cc. of 5% H_2SO_4, and the flaky ppt. (about 1 g.) was filtered off and washed with ether. The product was assigned the structure of a 4-bromo-γ-lactonic acid: $BrCH_2CH(CO_2H)CH_2CO$. The proof of its structure rested on the behavior of the product toward alk. hydrol. There should be and there was a break in the compd. and formation of $BrCH_2CHO$ and malonic acid, which actually were recovered, the latter as Ba malonate. The product was misd. in water, alc. and benzene and very slightly sol. in ether.

Rebecca Yablonsky

ASM TLA METALLURGICAL LITERATURE CLASSIFICATION





ca

PROCESSES AND PROPERTIES INDEX

β-Lactones and β-lactonoacids. III. Condensation of citral with malonic acid. N. S. Vul'fson and M. M. Shemyakin. *J. Gen. Chem.* (U.S.S.R.) 13, 440-47 (1943) (English summary); cf. *C. A.* 37, 611⁹.—Malonic acid (20 g.), 30 g. citral and 3 cc. glacial AcOH are treated with 3 cc. piperidine, heated on a water bath for 1.5 hrs. when the mass solidifies. After washing with Et₂O the solid is crystd. from 60% alc., to yield 19 g. (40%) *dilactone of citrylidenemalonic acid*, $Me_2C:CHCH_2CH_2$ (O–CO) CMe.CH_2.CH.CH.CO.O, (I), m. 180-7°. The mother liquors yield *citrylidenoacetic acid*, b₁₀ 165-75° (decomp.). I (1 g.), heated to soln. with 4 cc. 10 *N* NaOH, boiled for 2-3 min. and acidified by dil. H_2SO_4, yields 0.8 g. $Me_2C:CHCH_2CH_2CMe(OH)CH_2CH.CH(CO_2H).CO.O$, m. 113-14° (after extn. with hot benzene); the evapd. benzene extract yields 0.1 g. $Me_2C:CHCH_2CH_2CMe(OH)CH_2CH.CH_2.CO.O$ (II), m. 120-0.5°; a soln. of the Na salt of the above acid, on acidification, yields the mixt. of the acid and the above lactone, indicating fairly ready decarboxylation; the Ag salt of the acid appears to have an appreciable water sol., while AcCl leads to loss of some CO_2 and yields II. I boiled with 10 *N* NaOH and acidified, yields 57% II, which, treated with slight excess of 0.1 *N* NaOH, acidified by HNO_3 and treated with $AgNO_3$, gave $Me_2C:CHCH_2CH_2CMe(OH)CH_2CH:CHCO_2Ag$. II is not affected by Ac_2O in pyridine at about 100°, while AcCl yields 47.5% $Me_2C:CHCH_2CH_2CMe(OAc)CH_2CH.CH_2.CO.O$ m. 117-18° (from benzene). Oxidation of II by alk. $KMnO_4$ yielded $(CO_2H)_2$ while no HCO_2H was detected, thus indicating the presence of the β-lactone ring. IV. The rate of opening of the β-lactone ring. M. M. Shemyakin and N. S. Vul'fson. *Ibid.* 448-56 (English summary).—The authors studied the rate of ring opening of the lactones $Me_2C.CH(CO_2H).CO.O$ and $PhCH.CH(CO_2H).CO.O$ at various temps. The results, presented in tabular and graphical form, show that the ring opening of β-lactones is a 1st-order reaction. There are indications that the hydrolysis in alk. medium leads to unsatd. acids and that the hydrolysis reaction is a tautomeric one. For the 2 lactones tried (above) the activation energy of hydrolysis was found to be 19,223 and 22,852 cal., resp. O. M. Kondakova

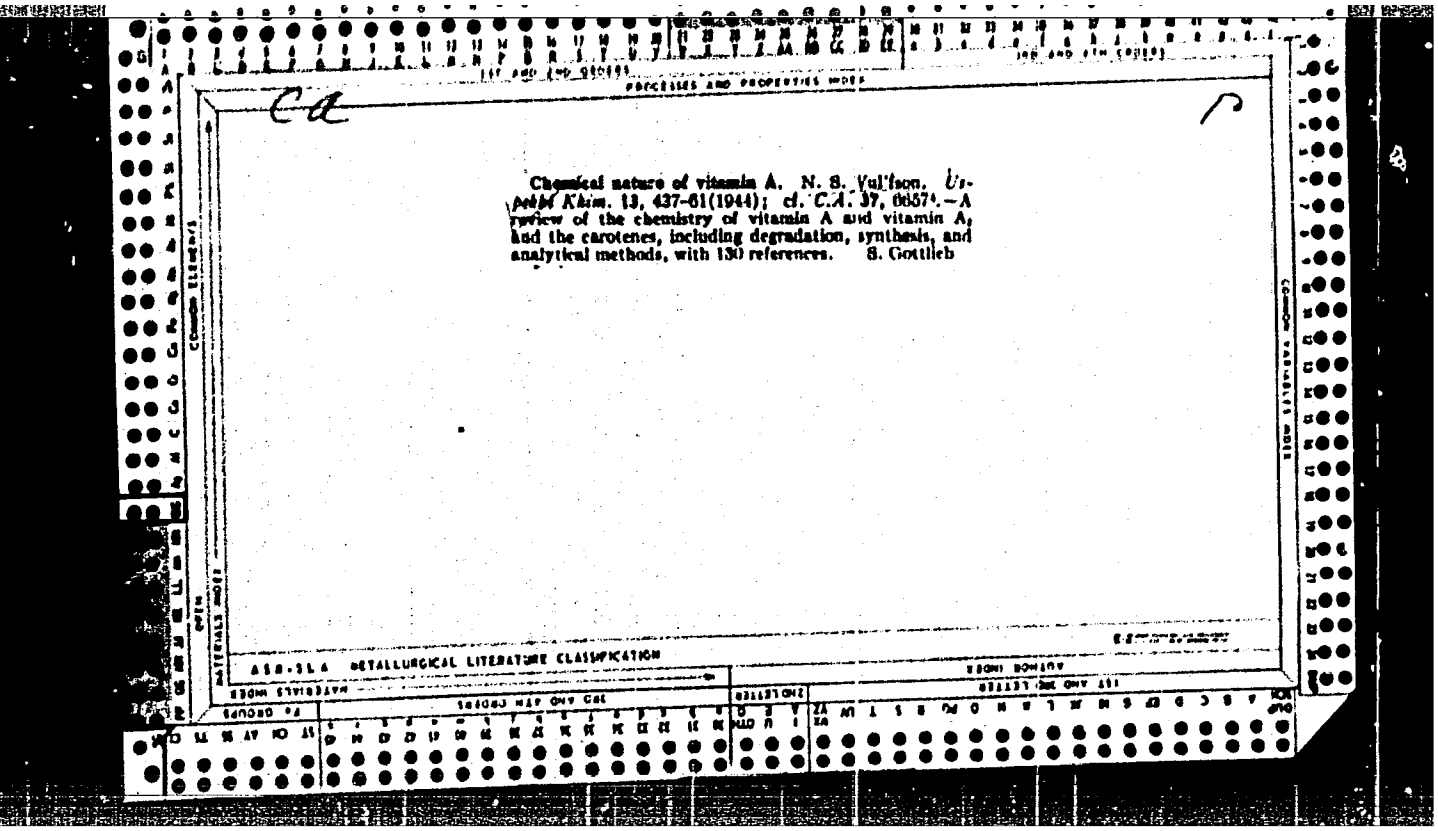
10

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

VULFSON, N. S.

"Investigation of B-Lactones and B-Lactono-Acids. IV. Study of the Reaction Rate of the Cleavage of the Lactone Ring". Shemyakin, M. M. and Vulfson, N. S. (p. 455)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1943, Volume 13, no. 6.



Chemical nature of vitamin A. N. S. Vul'fson. *Uspekhi Khim.* 13, 437-61(1944); cf. *C.A.* 37, 6657⁴.—A review of the chemistry of vitamin A and vitamin A, and the carotenes, including degradation, synthesis, and analytical methods, with 130 references. S. Gottlieb

CA

Research in β-lactones and β-lactone acids. V. Mixed anhydrides of malonic and acetic acids. N. S. Vul'fson. *J. Gen. Chem.* (U.S.S.R.) 19, No. 10, 1809-81(1949)(English translation).—See *C.A.* 44, 1901*f*.
E. J. C.

CA

β-Lactones and β-lactone acids. V. Mixed anhydrides of malonic and acetic acids. S. S. Yul'fson. *Zhur. Obshchei Khim.* (J. Gen. Chem.) 19, 1004–16(1949); cf. *C.A.* 38, 3259. $CH_2(CO_2H)_2$ with Ac_2O yields 2 mixed *aceto-malonic anhydrides* in a reaction catalyzed by H_2SO_4. Shaking 10 g. powd. $CH_2(CO_2H)_2$, 40 g. Ac_2O, and 3 drops H_2SO_4 until soln. occurs and letting stand overnight, followed by concn. *in vacuo* at 40–50°, gave a syrup which on treatment with 15 ml. abs. EtOH, followed by cooling and extn. with Et_2O, gave 1.5 g. MeOAc and 60°, *$CH_2(CO_2Me)_2$* (I), b$_{15}$ 74.7°, n_D^{20} 1.4140, while an ext. with Na_2CO_3 gave 24.7% *$HO_2CCH_2CO_2Me$* (II), b$_{10}$ 115.8° (decompn.). If the reaction mixt. above after vacuum concn. is extd. with Et_2O and the ext. is treated with MeOH, there is formed 2.6 g. MeOAc, 51% I, and 22% II, as well as a trace of $CH_2(CO_2H)_2$. Similar results are obtained if H_2SO_4 is omitted and the mixt. is allowed to stand 24 hrs. before concn. and reaction with MeOH. $(CH_2CO_2Ag)_2$ (12.8 g.) with 6.3 g. AcCl in Et_2O gave upon filtration a yellow syrup, which gave 93.5% I with MeOH; 8.4 g. Ag salt and 3.1 g. AcCl gave 84.7% II and 13.3% MeOAc. The mixed anhydride from 10 g. $CH_2(CO_2H)_2$ and 10 g. Ac_2O gave with 20 g. BuOH, 2.7 g. $CH_2(CO_2H)_2$, 39% *$HO_2CCH_2CO_2Bu$* (undistillable without decompn.), and 11.5% di-Bu ester, as well as 3.5 g. BuOAc; similar reaction with 12 g. Me_3COH gave 35.7% *$HO_2CCH_2CO_2CMe_3$* (isolated as the *Ag salt*), and 14.5% *di-tert-Bu ester*, b. 220–5° (with some decompn.), as well as 1 g. *tert*-BuOAc; 2-octanol (25 g.) gave 2.2 g. $CH_2(CO_2H)_2$, 0.5 g. 2-octyl acetate, 14.5%; *2-octyl H malonate*, and 15.9% *corresponding neutral ester*, b$_{10}$ 169–70°, n_D^{20} 1.4367. Dodecyl alc. (35 g.) gave a small amt. of dodecyl acetate, b$_{15}$ 149–52°, 16.5% *didodecyl malonate*, m. 33–4°, and 23% *dodecyl H malonate*, m. 42–3° (from iso-Am_2O); 20 g. PhOH gave a little PhOAc, 13.2% *di-Ph malonate*, m. 49.5–51.0°, and 17.3% *Ph H malonate*, m. 65–6° (from iso-Am_2O), while 10 g. $PhNH_2$ gave 71% *malonanilide*, m. 224–4.5° (from MeOH); similar addn. of 15 g. $PhNH_2$ in 25 ml. Et_2O gave 12 g. of the anilide while the Et_2O mother liquor yielded about 1 g. AcNHPh and the dk. ext. gave 4.5 g. *malonanilic acid*, m. 141.2° (from AcOH), which on heating to the m.p. gave AcNHPh. Addn. of 2 drops H_2SO_4 to 5 g. II and 20 ml. Ac_2O, letting stand 24 hrs., and evapn. *in vacuo* at 50° gave the *mixed anhydride of aceto acid* and II, b$_{10}$ 70–1°, b$_{15}$ 84–5°, n_D^{20} 1.4406, which (3 g.) treated with 5 ml. MeOH gave I, while 3 g. $PhNH_2$ gave 0.4 g. AcNHPh and 1 g. II; treatment of the mixed anhydride with *p*-$O_2NC_6H_4CH_2Br$ in hot aq. alc. NaOH for 1 hr. gave *p-nitrobenzyl acetate* and *malonate*, m. 77–9° and 82.5–84.0°, resp. Allowing 1 g. $HO_2CCH_2CO_2Bu$ and 10 g. Ac_2O to stand 24 hrs. gave 50% *mixed anhydride of aceto acid and Bu H malonate*, b$_{15}$ 146–48°, which (1 g.) with 2 g. $PhNH_2$ gave AcNHPh. Similarly *$HO_2CCH_2CO_2Ph$* gave the corresponding *mixed anhydride* with Ac_2O, m. 55.5–56.0° (from iso-Am_2O), giving $HO_2CCH_2CO_2Ph$ and AcNHPh with $PhNH_2$. G. M. K.

VULFSON, N. S.

USSR/Chemistry - Laboratory Equipment Sep 50

Continuous-Action Counterflow Extraction Apparatus for Laboratory Use," F. N. Stepanov, N. S. Vulfson, I. A. Mikova, Sci Res Inst of Org Intermediate Products and Dyestuffs

"Zavod Lab" Vol XVI, No 9, pp 1131.

New apparatus for extraction from solutions was constructed and tested in operation. Extraction occurs in narrow vertical tube in which solution and solvent, flowing toward each other, are stirred vigorously by spiral ribbon mixer. Apparatus is designed for operation with types of solvent heavier or lighter than solution. Main advantage of extractor is its efficiency, and small amount of solvent used.

PA 169T28.

VUL'FSON, N.S.; PODREZOVA, T.N.; SENYAVINA, L.B.

Dieckmann reaction. Part 13: Infrared and ultraviolet spectra of methyl- and carbethoxy derivatives of 3-chromanone. Zhur. ob. khim. 34 no.8:2676-2681 Ag '64. (MIRA 17:9)

1. Institut khimii prirodnykh soyedineniy AN SSSR i Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley (NIOPiK).

PUCHKOV, V.A.; STEPANOV, V.M.; VUL'FSON, N.S.; ZYAKUN, A.M.; KRIVTSOV, V.F.

Mass spectrometry of amino acid methylthiophydantoins. Dokl. AN SSSR 157 no.5:1160-1163 Ag '64. (MIRA 17:9)

1. Institut khimii prirodnykh soyedineniy AN SSSR.

C.A.

10

β Lactones and β lactone acids. VI. Mechanism of formation of β lactone acids. N. S. Vul'fson. *Zhur. Obshchei Khim.* 20, 125-30(1950); cf. *C.A.* 44, 6892i. It has been shown that only the neutral malonic acetic anhydride (I) is capable of reacting with carbonyl derivs.; the mixed acetic anhydride does not react. H_2SO_4, which catalyzes the anhydride formation, does not participate in the reaction with CO derivs. The 1st step of the reaction of I with Me_2CO is the formation of the mixed anhydride of AcOH and $Me_2C(OH)CH(CO_2H)_2$, which undergoes an intramol. reaction yielding the lactono-acid and Ac_2O. Crude I and Me_2CO, allowed to stand overnight, readily yield 18.0-55.5% (*isopropylidene-malono-β-lactone*, RR'C:CH·CO·O (R, R' = Me) m. 98.7° (from Me_2CO or C_6H_6), also obtained in 48.6% yield from 6.4 g. $CH_2(CO_2Ag)_2$ in 10 g. dry Me_2CO with 10 g. AcCl (added dropwise), followed by filtration and standing overnight; BzCl instead AcCl gives the same product, in addn. to some BzOH (amts. unstated). The crude I from 10 g. $CH_2(CO_2H)_2$ and 10 g. BzH, let stand overnight, gave 2.5%; *benzylidenemalono-β-lactone*, m. 145.6° (decompn.; from Me_2CO-C_6H_6), also obtained (1 g.) by addn. of 6.4 g. $CH_2(CO_2)_2Ag$ to 10 g. BzH, followed by 5 g. AcCl. *m*-$O_2NC_6H_4CHO$ in the 1st reaction gave 0.4 g. *m*-NO_2 *analog*, m. 158.5-59.0° (from MeOH), while cyclohexanone (1.0 g.) gave 1.5 g. *cyclohexylidenemalono-β-lactone*, m. 84-5°. The lactono acids were isolated in the form of the resp. Ag *salts* (undescribed and used only for analyses). When $Me_2CH:C(CO_2H)_2$ was treated with a trace of H_2SO_4 in Ac_2O, no lactonization took place even in 3 days, nor did its di-Ag salt yield any lactone with AcCl in Me_2CO; the benzylidene analog behaved similarly. Addn. of 3 drops concd. H_2SO_4 to 6.2 g. $Me_2C(CO_2H)_2$ in 25 ml. Ac_2O, followed by 2 hrs. at 60° and standing for 2 days gave, after distn. of the Ac_2O in vacuo and washing the residue with Na_2CO_3 soln. (in Et$_2$O), 4 g. *isopropylidene-acetic anhydride*, b_{11} 140-2°, b_{12} 117-18°, which yields the *anilide*, m. 127.5-8.0° (from EtOH); 0.5 g. original acid is reclaimed. $Me_2C:CHCO_2Ag$ with AcCl in Et$_2$O gave only the *free acid*, m. 67.5-9.0°. Addn. of 10 g. AcCl to 6.4 g. $CH_2(CO_2Ag)_2$ in 15 ml. dry Me_2CO, followed by filtration and separation of the filtrate into parts (a) and (b) gave from part (a), allowed to stand 2 hrs. after filtration, an unstated amt. of $CH_2(CO_2H)_2$, and from part (b), allowed to stand 1 day, an unstated amt. of isopropylidenemalono-β-lactone. A similar reaction in which the 24-hr. filtrate was treated with dry MeOH gave MeOAc, $CH_2(CO_2Me)_2$, AcOH, and a small amt. of the above lactone. PhOH instead of MeOH gave *di-Ph malonate*, m. 48.5-9.5°. Distn. of the 24-hr. filtrate yielded a small amt. of Ac_2O and the above lactone. **VII. Relationship between structure of carbonyl compounds and the product of its condensation with malonic acid.** *Ibid.* 135-41. The reactions of neutral acetic malonic anhydride (I) with CO derivs. indicate that the presence of an actual or potential OH group in the carbonyl compd. leads to formation of malonic esters and not the lactono acids; the latter form predominantly if the carbonyl deriv. is capable of resonance, with considerable local resonance in the CO group. The condensation does not occur if many resonant structures are possible in which the pos. pole is not at the C atom. I (from 10 g. $CH_2(CO_2H)_2$) and 10 g. AcPh in 48 hrs. at room temp. gave 2.5 g. *2-phenylethylidenemalono-β-lactone*, m. 91.5-2.0° (Ag *salt* of free acid used in analysis). Menthone

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(15 g.) in a 24-hr. reaction gave 4.8 g. *menthylidenemalono-β-lactone*, needles, m. 107.6–8.0° (decompn.; from MeOH); both the *Ag salt* of the *lactone* and *di-Ag salt* of the *free acid* were analyzed. $PhCH_2CH_2CHO$ (13.5 g.) gave in 24 hrs. 3.5 g. *hydrocinnamylidenemalono-β-lactone*, m. 130–40° (from Me_2CO-MeOH) (*Ag salt* of the *lactone*). *o*-Cl-C_6H_4CHO (7 g.) gave 1.5 g. *o-chlorobenzylidenemalono-β-lactone*, m. 121.0–3.5° (from $CHCl_3$) (the *Ag salt*); *p*-Cl *analog* (1.1 g.), obtained similarly, m. 151–5° (from EtOH-Me_2CO) (*Ag salt*); *m*-Cl *analog*, m. 101–2° (from EtOH and C_6H_6), was obtained in 2.5-g. yield (*Ag salt*). Diacetone alc. (20 g.) yielded 1 g. *acid ester of diacetone alc.* and $CH_2(CO_2H)_2$. $AcCH_2CMe_2OCOCH_2CO_2H$, an odoriferous yellow oil, yielding a *semicarbazone*, m. 232–4° (from EtOH). Paraldehyde (15 g.) gave 4.5 g. *acetaldol acid malonate*, $C_9H_{12}O_6$, an oil yielding a *semicarbazone*, m. 152–4° (from EtOH); *AcH* reacts similarly, and the same product forms from AcCl, AcH, and $CH_2(CO_2Ag)_2$. EtCHO (20 g.) gave 5 g. orange *propionaldol acid malonate*, $C_9H_{12}O_6$: *semicarbazone*, m. 177–9° (from EtOH). I (from 30 g. $CH_2(CO_2H)_2$ and 45 g. $AcCH_2CO_2Et$ gave 15 g. of the *corresponding enol acid malonate*, $C_9H_{12}O_6$, a yellow oil, yielding the *p-nitrobenzyl ester*, m. 202.5–4.0°. I (from 10 g. $CH_2(CO_2H)_2$ and 15 g. *mesityl oxide* gave 3 g. of *enol acid malonate*, oil, $C_9H_{12}O_6$ (*Ag salt*), also obtained from AcCl, $CH_2(CO_2Ag)_2$, and mesityl oxide. *Pseudoionone* (10 g.) with I gave 3 g. of the *enol acid malonate*, oil, $C_{16}H_{24}O_6$; *Ag salt*. PhCH:CHCOMe (15 g.) gave the *enol acid malonate* (4 g.), oil (*Ag salt*). I and 15 g. Cl_3CCHO gave in 24 hrs. 8 g. *chloral diacetate*, b. 111.5–12.5°, n_D^{25} 1.4214; reaction of 6.4 g. $CH_2(CO_2Ag)_2$ with 6 g. Cl_3CCHO and 10 g. AcCl gave in 24 hrs. 3 g. *chloral chloroacetate*, $Cl_3CCH(OAc)Cl$, b. 189–?°, n_D^{25} 1.4773. *Citral* gave mostly a tar and a little *p*-cymene; furfural gave a tar, while Ph_2CO and *p*-$Me_2NC_6H_4CHO$ failed to react. VIII. **Condensation of cinnamaldehyde with malonic acid.** *Ibid.* 503–9.—Crude acetic malonic anhydride (from 10 g. malonic acid) and 12.2 g. PhCH:CHCHO, let stand 1 day, yielded 6 g. malonic acid and 3 g. *cinnamylidenemalonic acid* (I), m. 205–6°, sepd. by $CHCl_3$ extn.; evapn. of the mother liquor yielded 3 g. $PhCH:CHCH(CO)_2C:CHCH:CHPh$, (II), m. 154–5.5° (from ligroin-C_6H_6), also obtained in 7.5-g. yield (m. 155.3–5.7°) from 3 drops concd. H_2SO_4, 10.4 g. malonic acid, 25 g. Ac_2O, and 14 g. PhCH:CHCHO after 1 day's standing; some I also forms. Titration of II uses 1 equiv. of NaOH and evapn. of the C_6H_6 ext. of the reacidified soln. regenerates II; if the product, however, is boiled with alkali, 2 equivs. of NaOH are used and acidification yields I. Pure II, m. 156.5–7.5°, is obtained in 0.7-g. yield by treating 0.6 g. PhCH:CHCHO, 2 g. AcOH, and 2 g. Ac_2O with 0.6 g. I and 1 drop of concd. H_2SO_4 and letting stand 1 day. AcCl (5 g.), 0.6 g. $CH_2(CO_2Ag)_2$, and 2.7 g. PhCH:CHCHO let stand 1 day and the AgCl removed gave 1.4 g. *cinnamylidenemalono-β-lactone*, m. 132–3° (from Me_2CO); addn. of $AgNO_3$ to the neutralized soln. gave the *Ag salt*, $C_{13}H_8O_4Ag_2$; the salt formed after boiling the acid in alk. soln. was $C_{13}H_{10}O_4Ag_2$. Boiling the lactone with Me_2CO 2 hrs. gave some I (from MeOH) and unchanged lactone. *Cinnamaldehyde diacetate*, m. 84–5°, prepd. in 11.5-g. yield from 10 g. PhCH:CHCHO and 20 g. Ac_2O with a trace of H_2SO_4, is unstable on storage. IX. Decarboxyla-

C. A.

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tion of β-lactono acids. *Ibid.* 600-2.—Heating 1 g. isopropylidenemalono-β-lactone with 10 ml. Ac_2O 25 hrs. to 60–70° gave on distn. *in vacuo*, 0.3 g. *β,β-dimethylacrylic acid*, m. 64-6°, also obtained (0.2 g.) on similar treatment of 1.5 g. $Me_2C:C(CO_2H)_2$. Heating 3.5 g. benzylidenemalono-β-lactone with 35 ml. Ac_2O 30 6 hrs. at 60-70° similarly gave 1.8 g. *cinnamic acid*. The formation of unsatd. acids from thermal treatment of the β-lactono acids in Ac_2O is an apparently general reaction and Masson's [*Ber.* 27, 1225(1894)] synthesis of $Me_2C:CHCO_2H$ from Me_2CO and malonic acid with Ac_2O probably involves β-lactono acid formation. X. **β-Lactone of menthylideneacetic acid.** *Ibid.* 603-5.—Dehydration of Et menthol acetate according to Wallach (*Ann.* 323, 151(1902); C.A. 1, 2160) gave *Et menthenylacetate*, bp 125 7°, and *menthylideneaceto - β - lactone*, $H_2C.CH(Me).CH_2.CH_2.CH(iso\text{-}Pr).C.CH_2.CO.O$, bp 138-41°; the latter opens the ring on heating with 0.1 *N* NaOH and acidification of the mixt. yields a product which is again not titrated by cold NaOH; i.e. the ring opening is reversible. Addn. of $AgNO_3$ to carefully neutralized (HNO_3) soln. which had been boiled 0.5 hr. with excess NaOH gave the Ag salt of the acid, $C_{13}H_{19}O_3Ag$. Oxidation of the lactone with $KMnO_4$ in Me_2CO gave menthone, the same being obtained from Et menthol acetate; menthone is not affected. When the lactone is boiled with 50% KOH, menthone is formed. The results indicate that Wallach's proposed structure of the lactone (γ-lactone) is incorrect and that β-lactone is the correct formulation.

USSR/Chemistry-Beta -Hydroxy Acids Apr 52

"The Problem of Preparing β-Hydroxyacids; Some Remarks on the Articles of A. M. Gakhokidze "Condensation of Ketones With Esters of Organic Acids;" N. S. Vul'fson

"Zhur Obshch Khim" Vol XXII, No 4, pp 718-720

In repeating Gakhokidze's expts on producing β-hydroxy acids, his findings were not confirmed. The consts of the original malinc ester cited by Gakhokidze do not agree with the consts of the diethyl and dimethyl esters of malonic acid. The consts of diethyl ester of isopropylidene malonic acid cited by the authors do not correspond to the 224154

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VUL'FSON, N.S.

consts given for this compd. Gakhokidze and Gudsadze's suggested method for sepg hydroxy acids by saponification with alcoholic alkali was not applied, because these substances decomp easily.

224154

VUL'FSON, N. S.

Defended his Dissertation for Doctor of Chemical Sciences, Kazan' State University 1953

Dissertation: "Investigation of Beta-Hydroxy Derivatives of Malonic Acid"

SO: Referativnyy Zhurnal Khimiya, No. 1, Oct. 1953 (W/29955, 26 Apr 54)

VUL'FSON, N. S.

The Reformatskiĭ reaction with bromomalonic ester. Condensation of bromomalonic ester with benzaldehyde. N. S. Vul'fson, *Sbornik Statei Obshchei Khim., Akad. Nauk S.S.S.R.* 1, 523-6(1953).—To 116 g. dry Me_2CO and 160 g. $CH_2(CO_2Et)_2$ in 200 ml. abs. Et_2O was added at 0° 50 g. powd. KOH (temp. rise to 8-12°) and the mixt. kept 2 hrs. in the cold, then 10 days at room temp. with occasional shaking, gave 100 g. K Et malonate. No condensation was achieved, since the liquid portion of the mixt. consisted of $CH_2(CO_2Et)_2$ only (cf. Galookidze and Guntsadze, *C.A.* 42, 2570*f* and V., *C.A.* 47, 1704*h*). Refluxing 10.6 g. BzH, 24 g. $BrCH(CO_2Et)_2$, 5 ml. dry C_6H_6, and 6.55 g. Zn shavings (pretreated with 10% HCl, washed and heated with a little iodine) 3 hrs. gave after cooling, and acidification with dil. H_2SO_4, an orange oil, which suffers decompn. during attempted distn. *in vacuo* yielding a distillate which is brightly colored (red or blue); redistn. gave 10 g. di-Et benzalmalonate, b_{16} 185-7°, readily hydrogenated to the dihydro deriv., which is hydrolyzed to the free acid, m. 116–17°. Free benzalmalonic acid m. 191–2°. If the mixt. (above) is saponf. directly with 5% NaOH in the cold in MeOH, there is obtained a solid ppt. which treated with dil. H_2SO_4 also gave benzalmalonic acid. The product which had not been heated (e.g., in the course of distn., above) does not take up H. Thus the directly formed intermediate must be a β-hydroxy deriv., which loses H_2O on heating and yields the benzalmalonate. The HO deriv. could not be isolated in the pure state. Et H benzalmalonate, m. 91-2°, is formed in small amts. during the above reaction.

G. M. Kosolapoff

VOL'FSON - N.S

β-Lactones and β-lactone acids. XI. Reformatskii reaction with bromomalonic ester. 2. β-Lactone of benzylmalonic acid. N. S. Vul'fson. *J. Gen. Chem. U.S.S.R.* 24, 1817–18(1954)(Russ. translation).—See *C.A.* 49, 13168c. B. M. R.

Vul'fson, N. S.

USSR/Chemistry - Reaction processes

Card 1/1 Pub. 151 - 28/37

Authors : Vul'fson, N. S.

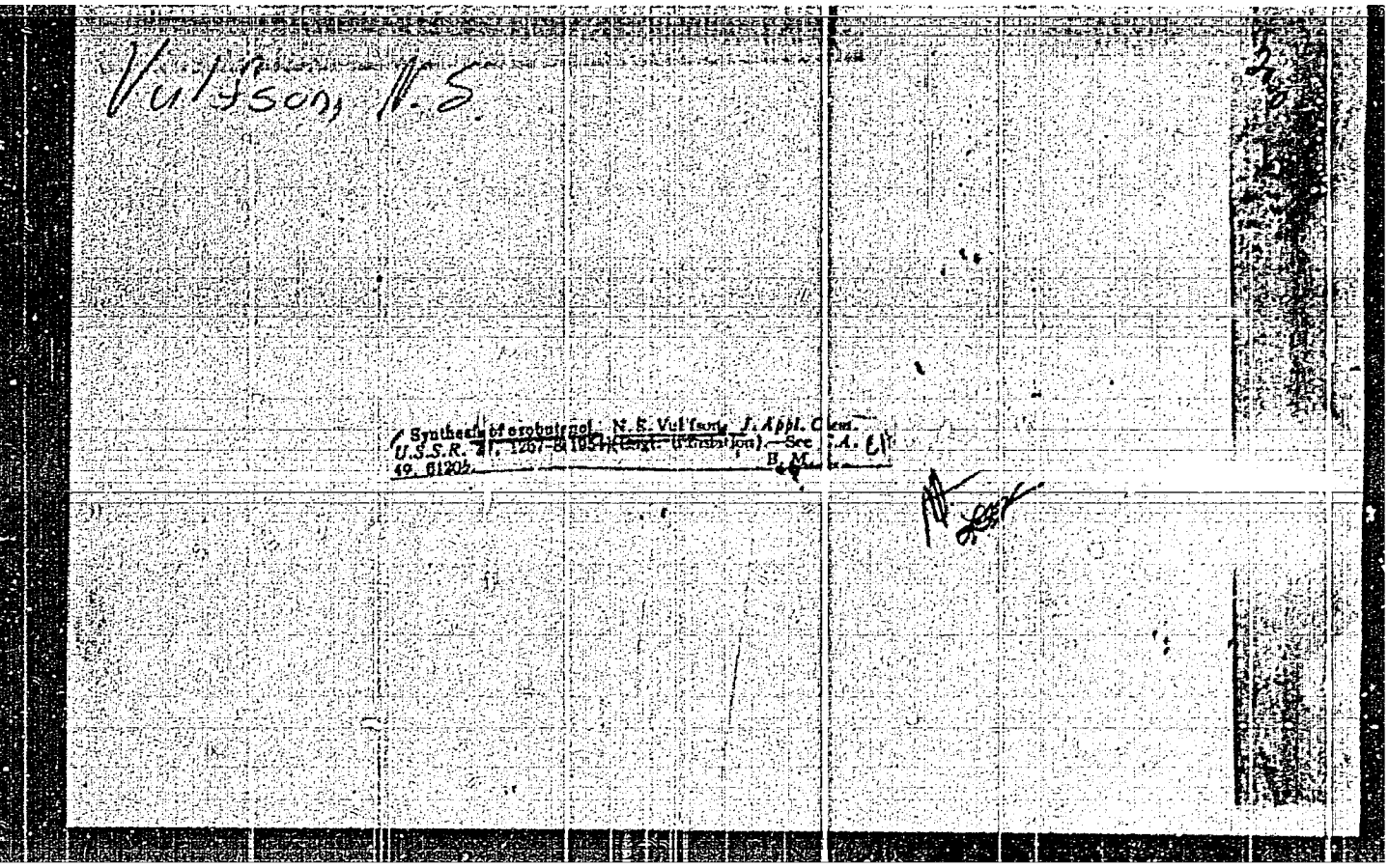
Title : Study of beta-lactones and beta-lactonic acids. Part 11.- The Reformatzky reaction with bromomalonic ester. II. Beta-lactone of benzalmalonic acid

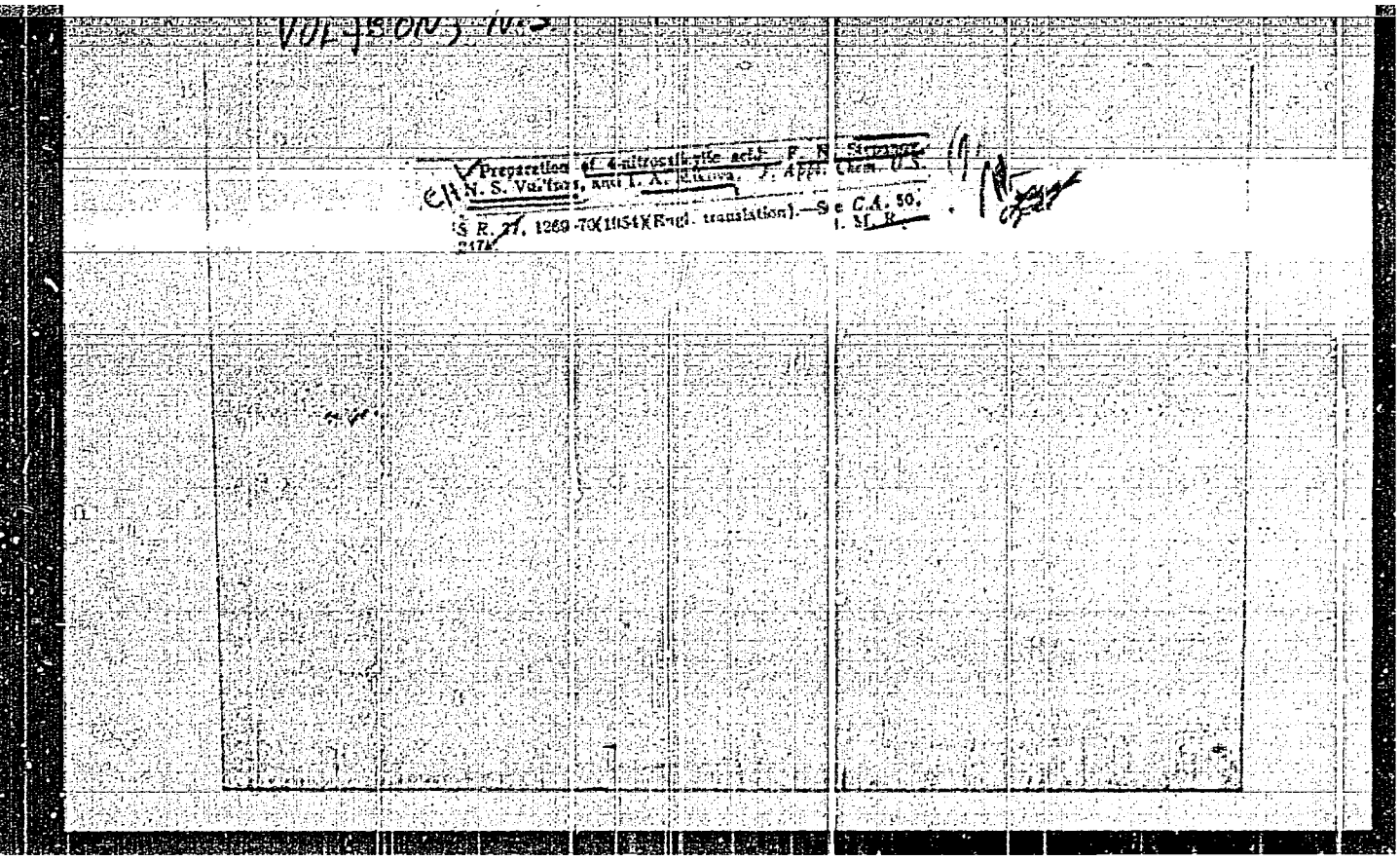
Periodical : Zhur. ob. khim. 24/10, 1853-1855, Oct 1954

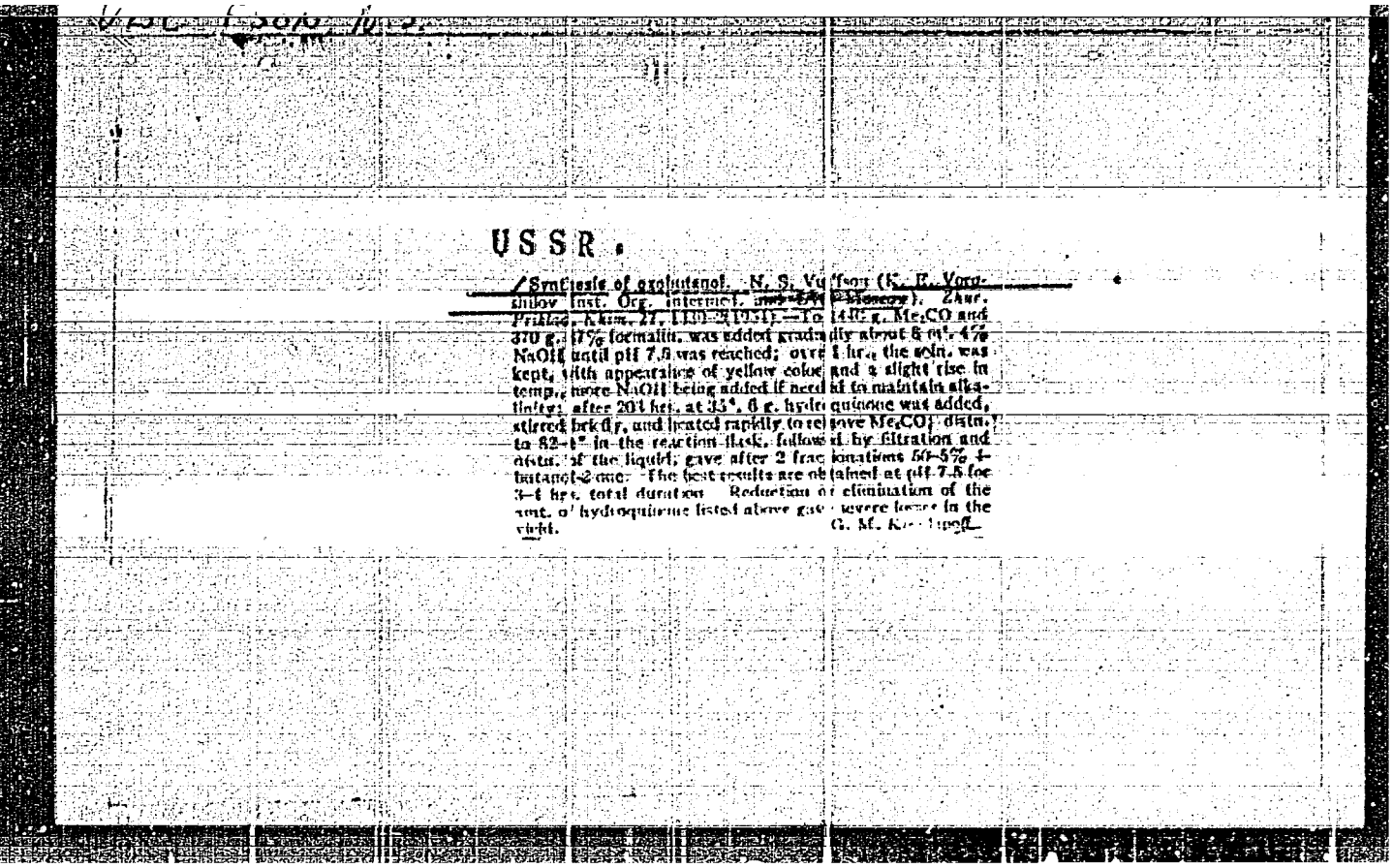
Abstract : The derivation of beta-lactone of benzalmalonic acid through the reaction of acetyl chloride with sodium salts formed during the saponification of the benzaldehyde - bromomalonic ester condensation (according to Reformatzky), is described. The product derived from a Reformatzky reaction between benzaldehyde and bromomalonic ester, and the intermediate product formed during the formation of beta-lactonic acid, are listed. Four references: 3-USSR and 1-USA (1936-1953).

Institution : The K. E. Voroshilov Scientific Research Institute of Semi-Products and Dyes

Submitted : May 8, 1954





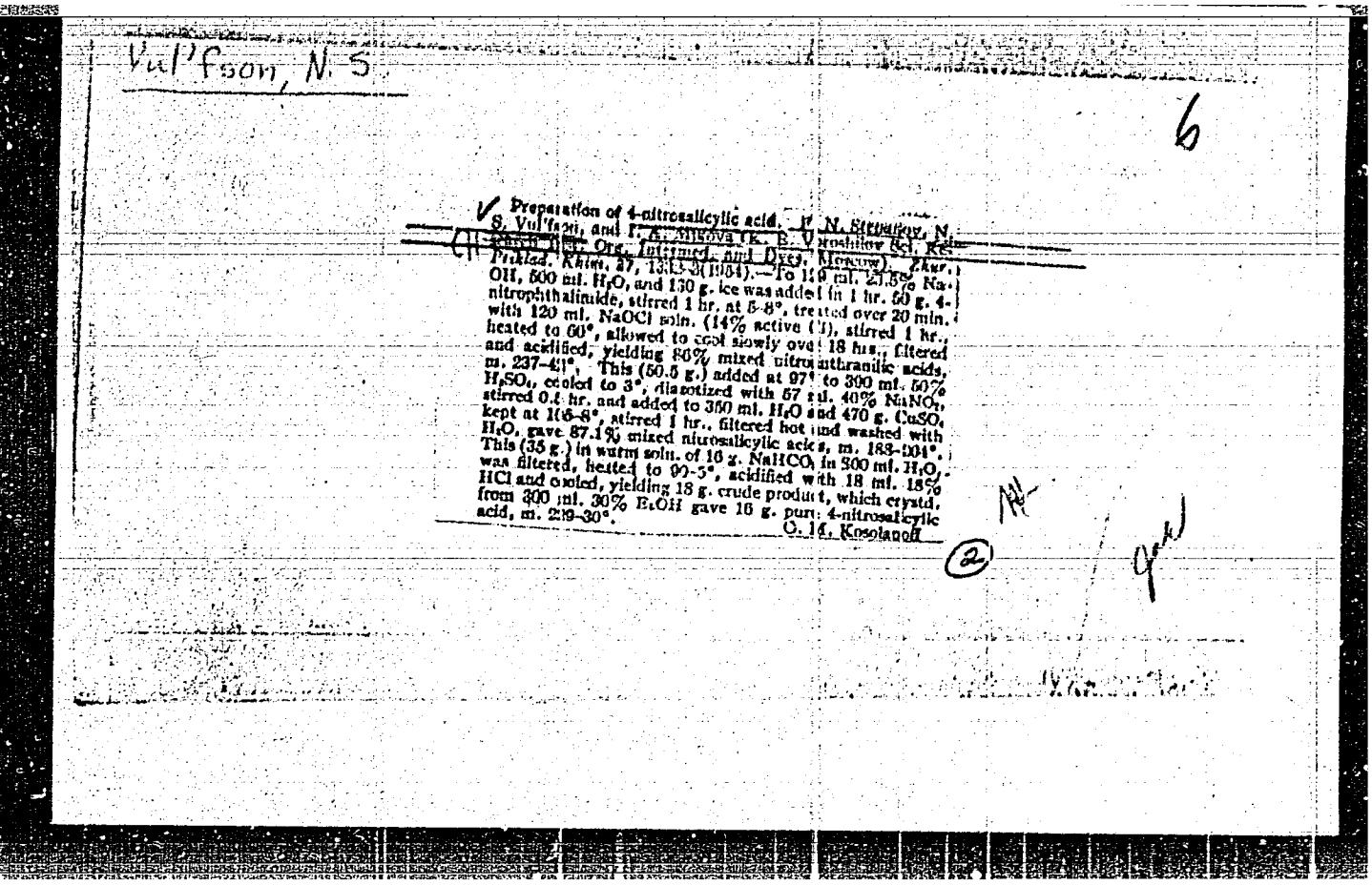


USSR

Synthesis of oxolutinol. N. S. Vu[illegible]ilov Inst. Org. Intermed. and Dyes, Priklad. Khim. 27, 1130-2(1954).—To 370 g. 37% formalin, was added gradually about 6 ml. 4% NaOH until pH 7.6 was reached; over 1 hr. the soln. was kept with appearance of yellow color and a slight rise in temp., more NaOH being added if need[ed] to maintain alkalinity; after 20 hrs. at 33°, 6 g. hydroquinone was added, stirred briefly, and heated rapidly to re[flux] gave Me_2CO; distn. to 82-4° in the reaction flask, followed by filtration and distn. of the liquid, gave after 2 fractionations 50-5% 4-butanol-2-one. The best results are obtained at pH 7.6 for 3-4 hrs. total duration. Reduction or elimination of the amt. of hydroquinone listed above gave lower yields.

[illegible]ison (K. P. Vorontsova). Zhur. 148 g. Me_2CO and

G. M. Kosolapoff



Vul'fson, N. S.

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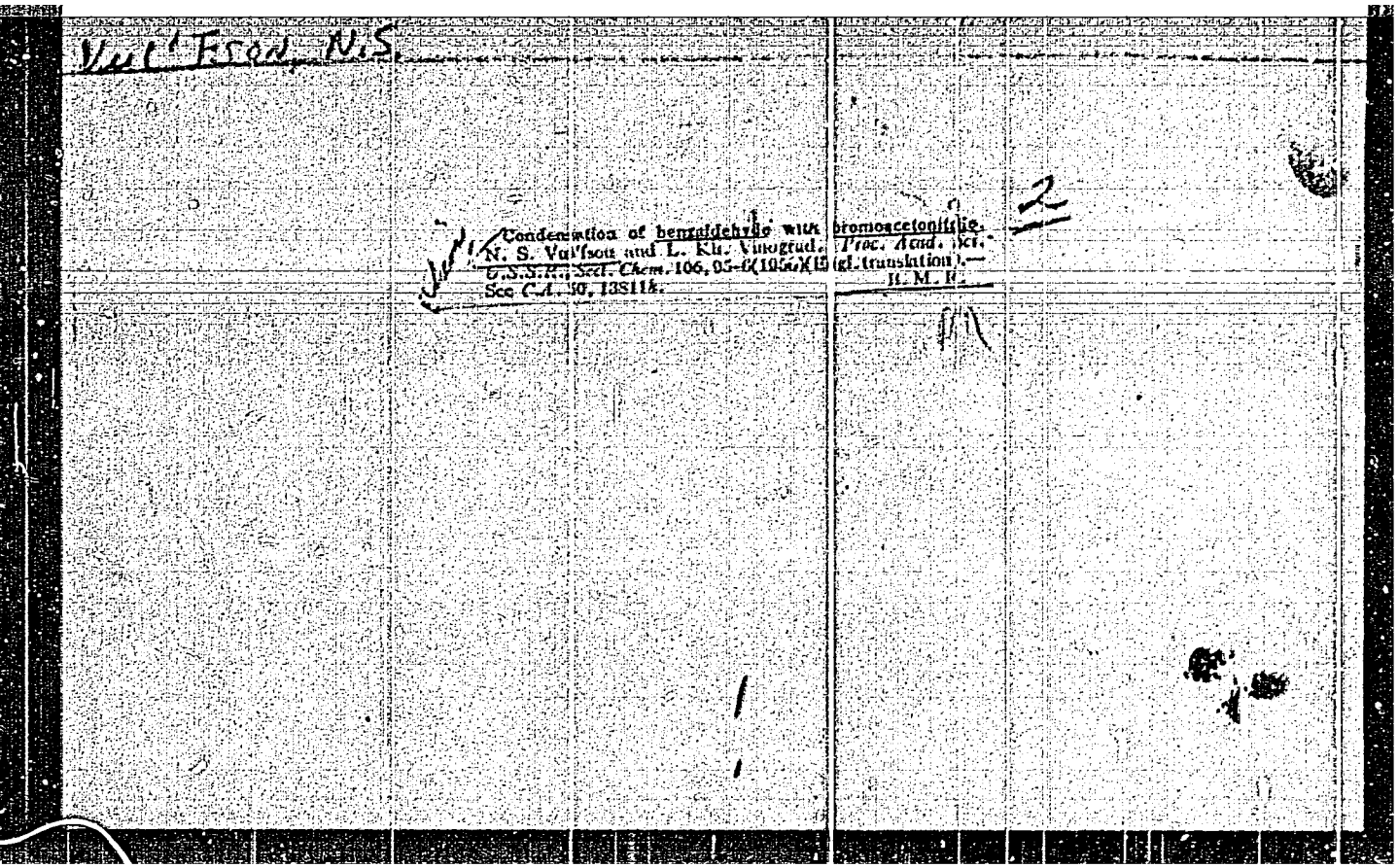
Preparation of 4-nitrosalicylic acid. [by] N. Sitnikov, N. S. Vul'fson, and [illegible] Org. Fertilizers and Dyes, Moscow) Zhur. Prikład. Khim. 27, 1313-5(1954).—To 110 ml. 27.5% NaOH, 500 ml. H_2O, and 130 g. ice was added in 1 hr. 50 g. 4-nitrophthalimide, stirred 1 hr. at 5-8°, treated over 20 min. with 120 ml. NaOCl soln. (14% active Cl), stirred 1 hr., heated to 60°, allowed to cool slowly over 18 hrs., filtered and acidified, yielding 80% mixed nitroanthranilic acids, m. 237-42°. This (50.5 g.) added at 97° to 300 ml. 50% H_2SO_4, cooled to 3°, diazotized with 57 ml. 40% $NaNO_2$, stirred 0.5 hr. and added to 360 ml. H_2O and 470 g. $CuSO_4$, kept at 105-8°, stirred 1 hr., filtered hot and washed with H_2O, gave 87.1% mixed nitrosalicylic acids, m. 183-104°. This (35 g.) in warm soln. of 16 g. $NaHCO_3$ in 300 ml. H_2O, was filtered, heated to 90-5°, acidified with 18 ml. 18% HCl and cooled, yielding 18 g. crude product, which crystd. from 300 ml. 30% EtOH gave 16 g. pure 4-nitrosalicylic acid, m. 219-30°.
O. M. Kosolapoff

(2)

HENRY, Thomas Anderson; DITKOVSKIY, D.P. [translator]; SUVOROV, N.N., [translator]; RODIONOV, V.M., akademik, redaktor [deceased]; VUL'FSON, N.S., doktor khimicheskikh nauk, redaktor; LEVINA, R.M., otvetstvennyy redaktor; SHPAK, Ya.G., tekhnicheskiy redaktor

[The plant alkaloids. Translated from the English] Khimiia rastitel'nykh alkoloidov. Perevod s angliiskogo. Pod red. V.M. Rodionova. i N.S.Vul'fsona. Moskva, Gos. nauchno-tekhn. izd-vo. khim. lit-ry, 1956. 904 p. (MLRA 10:1)
(Alkaloids)



Vul'Fsad, N.S.

Condensation of benzaldehyde with bromoacetonitrile.
N. S. Vul'fson and L. Ku. Vinogrud. *Proc. Acad. Sci.*
U.S.S.R., Sect. Chem. 106, 93-6(1956)(English translation).
See C.A. 50, 13811h.
M. M. P.

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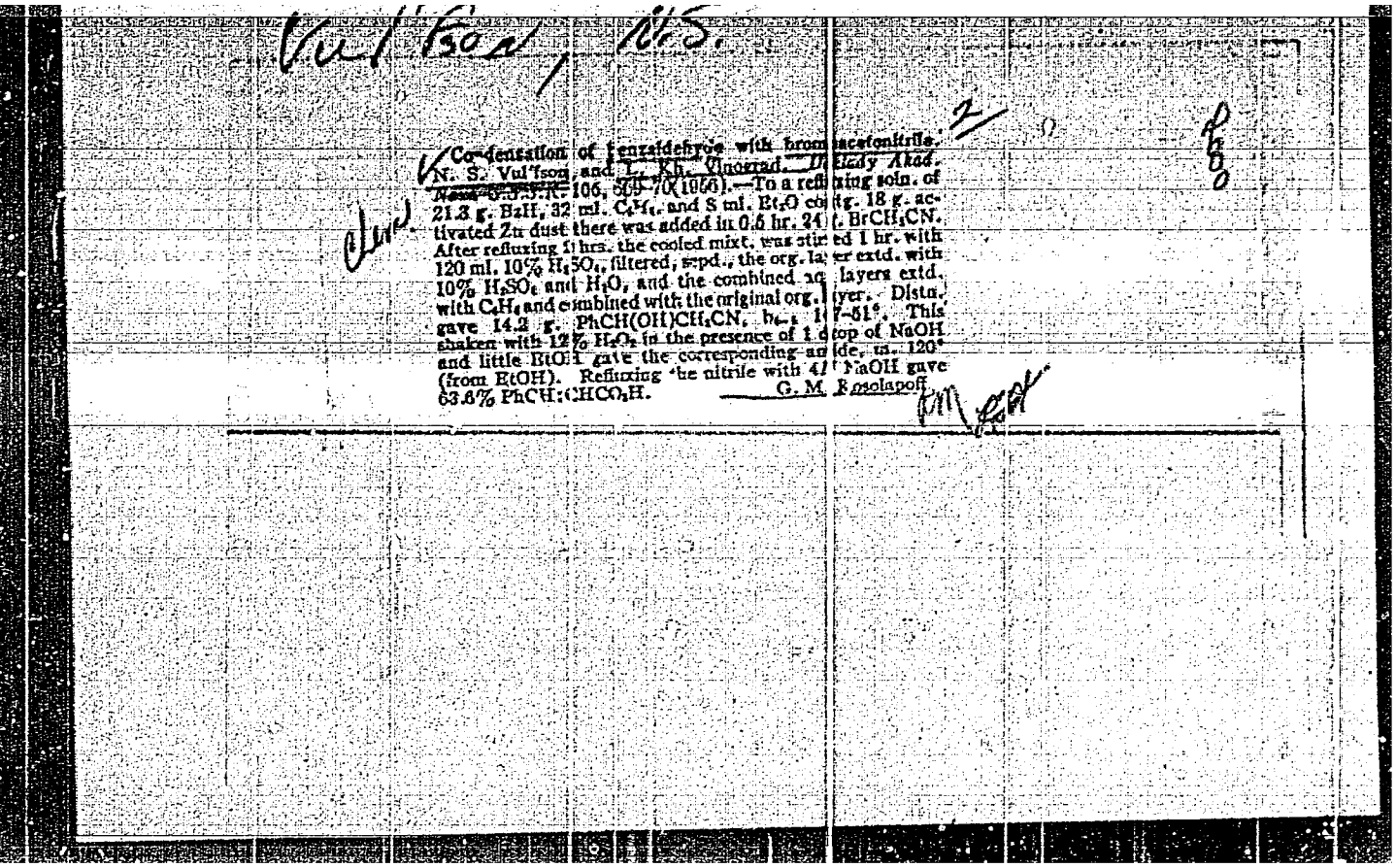
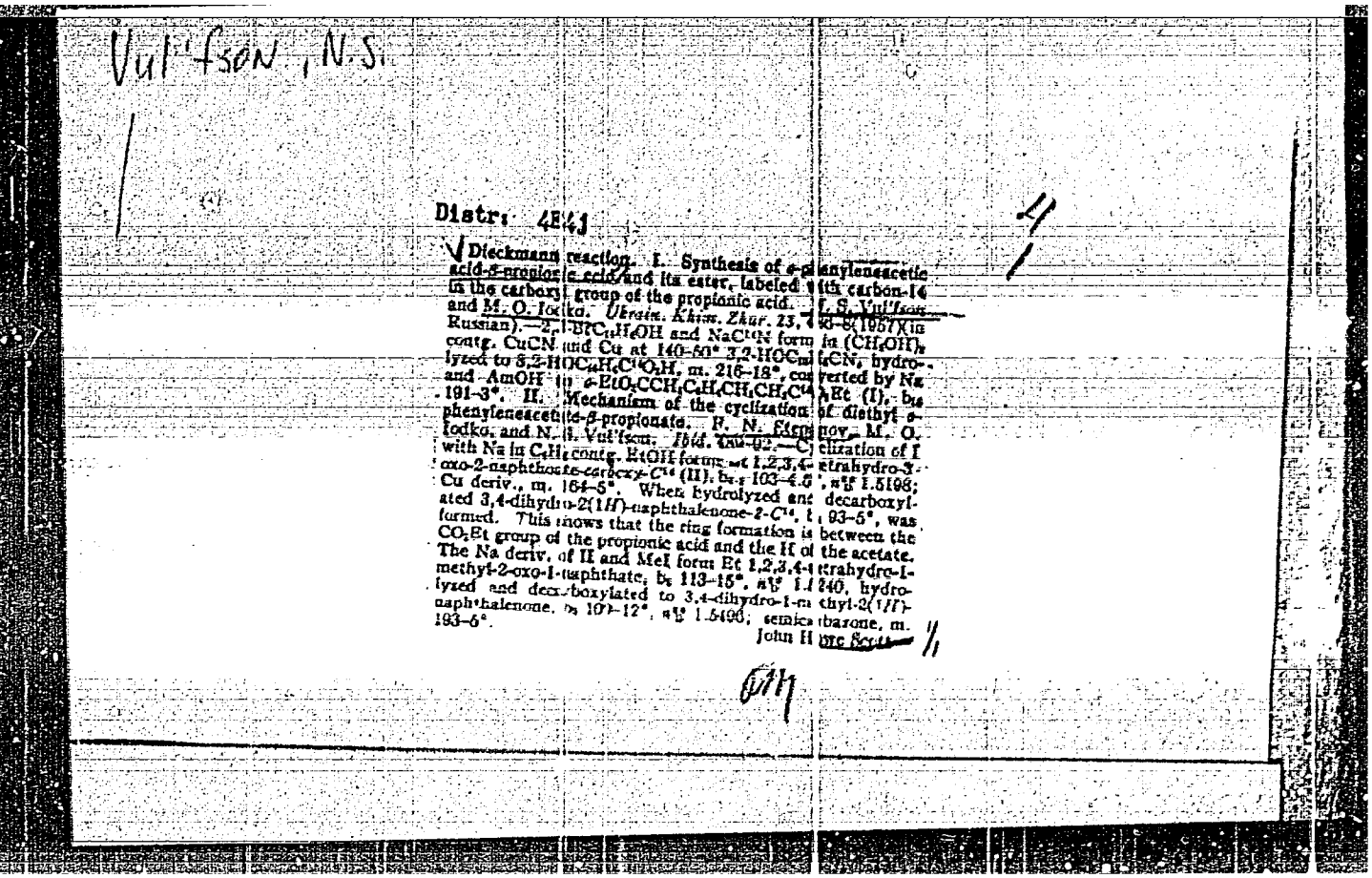


Condensation of benzaldehyde with bromoacetonitrile. N. S. Vul'fson and L. Kh. Minorad. Doklady Akad. Nauk S.S.S.R. 106, 609-10 (1956).—To a refluxing soln. of 21.3 g. BzH, 32 ml. C_6H_6, and 8 ml. Et_2O contg. 18 g. activated Zn dust there was added in 0.6 hr. 24 g. $BrCH_2CN$. After refluxing 4 hrs. the cooled mixt. was stirred 1 hr. with 120 ml. 10% H_2SO_4, filtered, sepd., the org. layer extd. with 10% H_2SO_4 and H_2O, and the combined aq. layers extd. with C_6H_6 and combined with the original org. layer. Distn. gave 14.2 g. $PhCH(OH)CH_2CN$, b$_{4-5}$ 147-51°. This shaken with 12% H_2O_2 in the presence of 1 drop of NaOH and little EtOH gave the corresponding amide, m. 120° (from EtOH). Refluxing the nitrile with 4% NaOH gave 63.6% $PhCH:CHCO_2H$. G. M. Kosolapoff



Vul'fson, N.S.

Distr: 4E4j

Dieckmann reaction. I. Synthesis of o-phenyleneacetic acid-β-propionic acid and its ester, labeled with carbon-14 in the carboxyl group of the propionic acid. — L. S. Vul'fson and M. O. Iodko. *Ukrain. Khim. Zhur.* 23, [illegible] (1957) (in Russian). — 2,1-BrC$_6$H$_4$OH and NaC^{14}N form in (CH$_2$OH)$_2$ contg. CuCN and Cu at 140–50° 3,2-HOC$_6$H$_4$C^{14}N, hydrolyzed to 3,2-HOC$_6$H$_4$C^{14}O$_2$H, m. 216–18°, converted by Na and AmOH in o-EtO$_2$CCH$_2$C$_6$H$_4$CH$_2$CH$_2$C^{14}O$_2$Et (I), b$_{15}$ 191–3°. II. Mechanism of the cyclization of diethyl o-phenyleneacetate-β-propionate. F. N. Fateev, M. O. Iodko, and N. S. Vul'fson. *Ibid.* 24, [illegible]. — Cyclization of I with Na in C$_6$H$_6$ contg. EtOH forms 1,2,3,4-tetrahydro-3-oxo-2-naphthoate-carboxy-C^{14} (II), b$_{1.5}$ 103–4.5°, n_D^{20} 1.5198; Cu deriv., m. 164–5°. When hydrolyzed and decarboxylated 3,4-dihydro-2(1*H*)-naphthalenone-2-C^{14}, b$_{15}$ 93–5°, was formed. This shows that the ring formation is between the CO$_2$Et group of the propionic acid and the H of the acetate. The Na deriv. of II and MeI form Et 1,2,3,4-tetrahydro-1-methyl-2-oxo-1-naphthate, b$_5$ 113–15°, n_D^{20} 1.5240, hydrolyzed and decarboxylated to 3,4-dihydro-1-methyl-2(1*H*)-naphthalenone, b$_5$ 107–12°, n_D^{20} 1.5496; semicarbazone, m. 193–6°.

John H[illegible] Scott

Vul'fson, N.S.

STEPANOV, F.N.; IODKO, M.O.; VUL'FSON, N.S.

Investigation of Dieckmann's reaction. Part 2: Mechanism of the cyclization reaction of diethyl ether of o-phenyleacetic-β-propionic acid. Ukr.khim.zhur. 23 no.4:489-492 '57. (MIRA 10:10)
(Chemical reaction--Mechanism)
(Propionic acid)

VUL'FSON, N.S.

79-2-21/64

AUTHORS: Vul'fson, N. S., Zaretskiy, V. I.

TITLE: Investigations in the Field of Dieckmann (Dikman)'s Reaction (Issledovaniye v oblasti reaktsii Dikmana) III. Cyclization of the Diethyl Ether of α-Methylpimelic Acid (III. Tsiklizatsiya dietilovogo efira α-metilpimelinovoy kisloty)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 2, pp. 369 - 372 (USSR)

ABSTRACT: The cyclization of the diethyl ether of α-methylpimelic acid was described by Dieckmann (Dikman) (reference 1). He supposed that 2-methyl-6-carbethoxycyclohexanone is formed on that occasion, but it was not eliminated in a pure state. As a continuation of the investigation of the cyclization process of the unsymmetrical dicarbonic acid ether (reference 2), according to Dikman, the authors wanted to determine the structure of the β-keto ether. The latter is produced by the cyclization of the diethylether of α-methylpimelic acid. The keto ether (I) is obtained as the only product. The formation of β-keto ether could not be determined. It is assumed that the exclusive formation of β-keto ether (I) in the cyclization is a consequence of the increased electron density at the α-carbon atom under the influence of the I-effect of the CH_3 group. This renders the dissociation of the proton and the formation of

Card 1/2

79-2-21/64

Investigations in the Field of Dieckmann (Dikman)'s Reaction . III. Cyclization of the Diethyl Ether of α-Methylpimelic Acid

the organic anion, which are necessary for the cyclization, difficult. Summary: The authors investigated the cyclization of the diethyl ether of α-methylpimelic acid according to Dikman. It was shown that 2-methyl-6-carbethoxycyclohexanone is the primary reaction product ; the formation of 2-methyl-6-carbethoxycyclohexanone was not observed. The structure of 2-methyl-6-carbethoxycyclohexanone was confirmed by the production of 2,6-dimethylcyclohexanone which was obtained by methylation with methyl iodide and subsequent hydrolysis and decarboxylation. There are 13 references, 2 of which are Slavic.

ASSOCIATION: Scientific Research Institute for Organic Semiconductors and Dyes (Nauchno-issledovatel'skiy institut organicheskikh poluprovodnikov i krasiteley)

SUBMITTED: January 21, 1957

AVAILABLE: Library of Congress

Card 2/2

VUL'FSON, N.S.; ZHURINA, F.G.; SENYAVINA, I.B.

Interaction of bromocyanoacetic ester with aromatic aldehydes in the Reformatskii and Widequist reactions. Dokl. AN SSSR 157 no.3:603-606 Jl '64. (MIRA 17:7)

1. Institut khimii prirodnykh soyedineniy AN SSSR i Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley. Predstavleno akademikom M.M. Shemyakinym.

Vul'fson N. S.

79-2-24/63

AUTHORS: Zaretskiy, V. I., Vul'fson, N. S.

TITLE: Investigations in the Field of Dikman's Reaction. (Issledovaniya v oblasti reaktsii Dikmana) IV. Cyclization of the Tetraethyl-ether of 2-Methylpentantetracarboxylic-1,1,5,5,-Acid (IV. Tsiklizatsiya tetraetilovogo efira 2-metilpentantetrakarbonovoy-1,1,5,5 kisloty)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 2, pp. 383 - 391 (USSR)

ABSTRACT: The authors continued the investigation of Dieckmann (Dikman)'s (reference 1) and investigated the cyclization of the tetraethyl-ether of 2-methylpentantetracarboxylic-1,1,5,5-acid (I). It became evident that in the presence of pulverized sodium in benzene the cyclization of tetraether (I) is not possible (the initial tetraether is regenerated). But in the presence of sodium ethylate in an alcohol solution it takes place. 3-methyl-2,6-dicarboethoxy-cyclohexanone (II) forms in a yield of 44,5 %. The cyclization is accompanied by a splitting off of diethylcarbonate (references 2, 3) which is formed during the distillation process of reaction products. The structure of the keto ether (II) is confirmed by the values of the elementary analysis, of the molecular refraction as well as by the formation of 3-methylcyclohexanone (III), as a re-

Card 1/3

Investigations in the Field of Dikmann's Reaction. IV. Cyclization of the Tetraethylether of 2-Methylpentantetracarboxylic-1,1,5,5,-Acid

sult of its hydrolysis and the decarboxylation. The constants of the latter correspond to those described in publications for this substance (references 4-6). The initial tetraethylether of 2-methylpentantetracarboxylic-1,1,5,5-acid (I) was obtained by the condensation of 1,3-dibromobutane with sodium diethyl malonate. In the interaction of the stoichiometric quants of the malonic ester and the dibromide the yield of tetraether (I) amounted to 12,8 %, although sodium bromide was obtained in a quantity of 90 %. In the condensation of 1 Mol of 1,3-dibromobutane with 2 Mol of sodium diethyl malonate and in the presence of a large excess of malonic ester (4 Mol) the tetraether was obtained according to a method analogous to that by V. P. Gol'mov and B. A. Kazanskiy (reference 7), with a yield of 36,9 %. A further increase in the excess of malonic ester does not influence the yield of the condensation product. Conclusions: The cyclization of the tetraethylether of 2-methylpentantetracarboxylic-1,1,5,5-acid was investigated according to Dikmann. It was shown that 3-methyl-2,6-dicarbethoxycyclohexane represents the primary reaction product. Its structure was confirmed by the production of 3-methylcyclohexanone with its ketone splitting. There are 11 references, 4 of which are Slavic.

79-2-24/64

Investigations in the Field of Dikman's Reaction. IV. Cyclization of the Tetraethylether of 2-Methylpentantetracarboxylic-1,1,5,5,-Acid

ASSOCIATION: Scientific Research Institute for Organic Semiproducts and Dyes, Moscow
(Moskovskiy nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley)

SUBMITTED: February 13, 1957

AVAILABLE: Library of Congress

Card 3/3

AUTHORS: Vul'fson, N. S., Zaretskiy, V. I. SOV/79-28-7-41/64

TITLE: Investigation in the Field of Dikman's Reaction (Issledovaniye v oblasti reaktsii Dikmana) V. The Cyclisation of the Diethyl Ester of α-Carbethoxypimelic Acid (V. Tsiklizatsiya dietilovogo efira α-karbetoksipimelinovoy kisloty)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol. 28, Nr 7, pp. 1909 - 1914 (USSR)

ABSTRACT: The authors investigated the cyclization of the diethyl ester of α-carbethoxypimelic acid according to Dikman (Ref 1). Earlier they had shown that in the cyclization of this ester of α-methylpimelic acid 2 methyl-6-carbethoxycyclohexanone is formed without any doubt. Instead of the normally expected 2-carbethoxycyclohexanone (Formula II) with a simultaneous cleavage of the diethylcarbonate the authors in boiling xylene in the presence of powdery sodium obtained the 2,6-dicarbethoxycyclohexanone (III). It must be noticed that the cyclization of (I) with the same sodium in alcohol solution does practically not take place, while that of the tetraethylesters of the pentane- and

Card 1/3

Investigation in the Field of Dikmans Reaction. V. SOV/79-28-7-41/64
The Cyclisation of the Diethyl Ester of α-Carbethoxypimelic Acid

2-methyl-pentanetetracarboxylic acids-1,1,5,5 in sodiumethylate alcohol solution is accompanied by a cleavage of the diethyl-carbonate and leads to the formation of the β-keto ester (III) (35%)(Ref 3) and 3-methyl-2,6-dicarbethoxycyclohexanone (44%). The formation of (III) can be explained by spatial difficulties. The structure of the compound (III) was proved by its methyl-ation with methyliodide to (IV) and (V) correspondingly, and after the hydrolysis and decarboxylation of the latter also by the formation of the known cyclohexanones (VI) and (VII). The initial product (I) was produced according to two methods. (Refs 4,5,6). There are 16 references, 5 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley imeni K.Ye.Voroshilova (Scientific Research Institute for Organic Semi-finished Products and Dyes, imeni K. Ye. Voroshilov)

SUBMITTED: May 11, 1956
Card 2/3

Investigation in the Field of Dikman's Reaction. V. SOV/79-28-7-41/64
The Cyclisation of the Diethyl Ester of α-Carbethoxypimelic Acid

1. Ethyl esters--Chemical reactions 2. Acids--Chemical reactions

Card 3/3

5(3)
AUTHORS: Vinograd, L. Kh., Vul'fson, N. S. SOV/2o-123-1-25/56

TITLE: Reformatskiy's Reaction Involving Nitrobenzaldehydes (Nitrobenzal'degidy v reaktsii Reformatskogo)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 1, pp 97 - 98 (USSR)

ABSTRACT: Any efforts to introduce carbonyl compounds containing nitro-groups into the Reformatskiy reaction have so far been a failure (Ref 1). Also the use of these compounds in the Grignard (Grin'yar) reaction gave no satisfactory results (Ref 2). The causes of this failure, however, are different in each of these cases. In the Grignard reaction the reduction of the nitro-group by the Grignard reagent is the hindrance. It may be overcome by a low reaction temperature (Ref 2). Hence, the nitro-group does not inhibit the reaction of organometallic compounds with the carbonyl group. In the Reformatskiy reaction with carbonyl compounds the total zinc remains practically unchanged. If a

Card 1/3

mixed organozinc compound ought to be formed, in the presence of a carbonyl compound, it can be supposed that the nitro-group contained in it impedes the interaction of zinc with the halogen ester. It was possible to confirm this assumption, since the easily proceeding reaction of acetopherone with bromo acetic ester is completely stopped by addition of 0,05 mol of nitro-benzene. This occurs even if this reaction is carried out in tetrahydrofuran in the presence of mercuric chloride which is known to ease the course of the reaction (Ref 3). Apparently, the Reformatskiy reaction in the presence of carbonyl compounds has to be performed in 2 steps: a) preparation of Reformatskiy reagens from zinc and ester, b) action exercised by the latter on a carbonyl compound. The authors used the method according to reference 4. They succeeded in producing the corresponding esters of β-oxy-β-nitro-phenyl-propionic acids from o-, m- and p-nitro benzal-dehydes as well as from bromo acetic ester. The successful carrying out of this reaction confirmed the above assumption, that the nitro group hinders the

Reformatskiy's Reaction Involving Nitrobenzaldehydes SOV/20-123-1-25/56

formation of mixed organozinc compounds. A characteristic of the resulting products is presented in table 1. There are 1 table and 6 Soviet references.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley im. K.Ye.Voroshilova (Scientific Research Institute of Organic Semi-Products and Dyes imeni K. Ye. Voroshilov)

PRESENTED: May 23, 1958, by B.A.Kazanskiy, Academician

SUBMITTED: April 16, 1958

Card 3/3

AUTHORS: Vinograd, L. Kh., Vul'fson, N. S. SOV/79-29-1-52/74

TITLE: The Reaction According to Reformatskiy With α-Halogen Nitriles (Reaktsiya Reformatskogo s α-galoidonitrilami) II. Condensation of Chloro Benzaldehydes With Bromo-Aceto Nitrile (II. Kondensatsiya khlorbenzal'degidov s bromatsetonitrilom)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 1, pp 245 - 247 (USSR)

ABSTRACT: In the previous reports the authors described the condensation of benzaldehyde with bromo-aceto nitrile according to the reaction by Reformatskiy which proceeds under formation of β-oxy-β-phenyl propionitrile. In continuation of this work they investigated the condensation of the o-, m- and p-chloro benzaldehydes with bromo-aceto nitrile under the usual conditions of this reaction. In this connection they obtained as in the case of application of the non-substituted benzaldehyde the corresponding, previously not described β-oxy-β-chloro-phenyl propionitriles. The nitriles were characterized by the elementary analysis, by the transformation according to Radziszewski (Ref 2)

Card 1/2

into the also hitherto not described oxyamides and by saponification into the well-known trans-o-, m- and p-chloro-cinnamic acids: $ClC_6H_4CHO + BrCH_2CN \xrightarrow{Zn} ClC_6H_4CH(OH)CH_2CN$

$ClC_6H_4CH(OH)CH_2CONH_2$ $ClC_6H_4CH=CHCOOH$

It is worth mentioning that the introduction of the chlorine atom into position 4 of the benzaldehyde increases somewhat the yield in oxynitrile as compared to the non-substituted benzaldehyde (53.4 instead of 48.2%), whereas the introduction of chlorine into position 2, and especially 3 of benzaldehyde leads to a reduction (43.0 and 27%). In the presence of mercury chloride (Ref 3), however, the yield in β-oxy-β-(3-chloro-phenyl)propionitrile increases up to 50.7%. There are 7 references, 3 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut poluproduktov i krasiteley (Scientific Research Institute of Intermediate Products and Dyes)

SUBMITTED: November 29, 1957

AUTHORS: Zaretskiy, V. I., Vul'fson, N. S. SOV/79-29-2-13/7?

TITLE: Investigation in the Field of the Dikman Reaction (Issledovaniye v oblasti reaktsii Dikmana). VI. Cyclization of Diethyl Ester of α-Acetyl and α-Benzoyl Pimelic Acid (VI. Tsiklizatsiya dietilovogo efira α-atsetil- i α-benzoilpimelinovoy kisloty)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 2, pp 416-421 (USSR)

ABSTRACT: The cyclization of α-acetyl (I) and α-benzoyldiethyl pimelate (II) according to Dikman is investigated here. The authors had already earlier shown that the cyclization of α-carbethoxydiethyl pimelate takes place unexpectedly on the non-substituted α-carbon atom and leads to 2,6-dicarbethoxycyclohexanone. It was of interest to clarify whether the cyclization (I) takes place on the substituted α-carbon atom in the direction to the formation of 2-carbethoxycyclo-hexanone (III) (with the cleavage of ethyl acetate) or of 2-acetylcyclo-hexanone (IV) (with the cleavage of diethyl carbonate) (Scheme 1). Actually, in the cyclization of (I) in boiling xylene in the presence of 1.4 g-at. powdery sodium or 1.4 mol sodium ethylate, compound (III) in 52-57% yield is formed, in which connection ethyl acetate separates. In the reaction of 1.5 mol sodium ethylate in alcohol

Card 1/3

Investigation in the Field of the Dikman Reaction. VI. Cyclization of Diethyl Ester of α-Acetyl and α-Benzoyl Pimelic Acid

solution, diethyl pimelate formed as chief product (V) in a yield of 35%, whereas the yield in (III), which separated in form of 2-phenyl-4,5,6,7-tetrahydro-indazolene-3, amounted to only 6.5%. Compound (III) cleaves into (V) only to a small extent (3.1%), whereas (I), on boiling with the alcohol solution of 0.2 mol sodium ethylate it forms compound (V) (2.2% yield), and with 1 mol sodium ethylate it yields 56%. The formation of small quantities (III), on processing (I) with the alcohol solution of 1.5 mol sodium ethylate, can be explained by the cyclization of (V) which takes place in a low yield. The problem concerning the reaction mechanism in the presence of powdery sodium was solved with smaller quantities of sodium (0.9 g-at). Ethylacetate (27.3%), (V, 13.9%) and (III, 16%) proved to be the chief products in this connection. Thus, alcoholysis (I) appears as the first process stage in non-alcoholic medium, under formation of compound (V), which then cyclizes into (III). An interpretation of this alcoholysis is suggested and the investigation results obtained are used to set up a scheme of the cyclization mechanism of α-acetyl and α-benzoyldiethyl pimelate (Scheme 2).

SOV/79-29-2-13/71

Investigation in the Field of the Dikman Reaction. VI. Cyclization of Diethyl Ester of α-Acetyl and α-Benzoyl Pimelic Acid

The structure of 2-carboethoxycyclo hexanone (III) was confirmed by the synthesis of the known 2-phenyl-4,5,6,7-tetrahydro-indazolone-3 from cyclohexanone. There are 11 references, 6 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley (Scientific Research Institute for Organic Semi-products and Dyes)

SUBMITTED: December 31, 1957

Card 3/3

5 (3)

AUTHORS: Vul'fson, N. S. Vinograd, L. Kh. SOV/79-29-4-24/77

TITLE: Reformatskiy's Reaction With α-halogen Nitriles (Reaktsiya Reformatskogo s α-galoidnitrilami). III. Condensation of the Methoxy-benzaldehydes With Bromo-aceto Nitrile (III. Kondensatsiya metoksibenzal'degidov s bromatsetonitrilom)

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 4, pp 1147-1149 (USSR)

ABSTRACT: The authors previously described the condensation of benzaldehyde and chloro-benzaldehydes with bromo-aceto nitrile (Refs 1, 2). Further, the condensation of bromo-aceto nitrile with o-, m-, p-methoxy- and 3,4-dimethoxy-benzaldehydes were investigated under the usual conditions of Reformatskiy's reaction. The β-(2-methoxy-phenyl)- and β-(3-methoxy-phenyl)-β-oxy-propionitriles, which so far have not yet been described, were accordingly obtained from o- and m-methoxy-benzaldehydes as well as with chlorobenzaldehydes and unsubstituted benzaldehyde. In the case of p-methoxy- and 3,4-dimethoxy-benzaldehydes the known nitriles of p-methoxy- and 3,4-dimethoxy-cinnamic acids were formed (Refs 3, 4). The β-(2-methoxy-phenyl)- and β-(3-methoxy-phenyl)-β-oxy-

Card 1/3 2

propionitrile were transformed by hydrogenperoxide into the amides of β-(2-methoxy-phenyl)- and β-(3-methoxy-phenyl)-β-oxy-propionic acids, and by saponification into the 2- and 3-methoxy-cinnamic acids. The condensation of m-methoxy-benzaldehyde and m-chloro-benzaldehyde (Ref 2) was carried out in a lower yield than with the o- and p-isomers, while mercury chloride increased the yield only from 22.1 to 25.7 %. Very good yields were attained with tetrahydrofuran instead of the usual solvents (Ref 5). In this connection the yields for o-, m-, p-methoxy- and 3,4-dimethoxy-benzaldehydes were increased from 49.7 to 70.4 %, from 25.7 to 74 %, from 34.6 to 62 %, and from 23 to 76.3 %, accordingly. The reaction in tetrahydrofuran proceeded abruptly, thus shortening reaction time and decreasing resin formation. There are 10 references, 4 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley (Scientific Research Institute of Organic Semi-products and Dyes)

KOROLEV, A.I., otv.red.; VUL'FSON, N.S., zam.otv.red.; BOGDANOV, S.V., red.; DOKUNIKHIN, N.S., red.; MASLENNIKOVA, Ye.V., red.; FODIMAN, I.V., red.; KHOMSKIY, I.G., red.; ZHTLIN, V.I., red.; SHPAK, Ye.G., tekhn.red.

[Organic intermediate products and dyes; collected articles] Organicheskie poluprodukty i krasiteli; sbornik statei. Moskva, Gos.nauchno-tekhn.izd-vo khim.lit-ry. No.1. 1959. 238 p. (MIRA 13:7)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley.

(Dyes and dyeing) (Aromatic compounds)

VUL'FSON, N.S.; IODKO, V.O.

Investigations in the field of Dieckmann reaction. Report No.1: Synthesis of ω-phenylone acetic-β-propionic acid and its ester tagged with C^{14} in the carboxylic group of the propionic acid residue. Org. poluprod. i kras. no.1:92-95 '59. (MIRA 14:11

(Propionic acid)
(Radioactive tracers)
(Dieckmann condensation)

STEPANOV, F. N.; VUL'FSON, N. S.

Investigation in the series of derivatives of acetonitrile. Report No.1. Hydrolytic splitting of acylcyanoacetic esters. Org. poluprod. i kras. no.1:222-230 '59. (MIRA 14:11)
(Acetonitrile)
(Cyanoacetic acid)

VUL'FSON, N. S.; DAVYDOVA, S. L.; LUKASHINA, L. I.

Investigation in the series of derivatives of acetonitrile. Report No. 2: 2-cyanomethylquinoxalone-3 and its derivatives. Org. polu-prod. i kras. no.1:231-236 '59. (MIRA 14:10)
(Acetonitrile)

AUTHORS: Vinograd, L. Kh., Vul'fson, N. S. SOV/79-29-8-53/81

TITLE: Reformatskiy's Reaction With α-Halogen Nitriles. IV. Condensation of Ketones With Bromoacetonitrile

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 8, pp 2690-2692 (USSR)

ABSTRACT: In previous papers (Ref 1), the reaction of bromoacetonitrile with different aromatic aldehydes was described which takes place according to Reformatskiy under usual conditions, and yields the β-oxynitriles. The authors carried on with the investigation of this reaction, and condensed ketones (acetophenone, cyclohexanone and dibutyl ketone) with bromoacetonitrile; the corresponding β-oxynitriles resulted. On distillation of β-oxy-β-phenylbutyronitrile, a partial dehydration takes place, and an impurity of the nitrile of the β-methyl-cinnamic acid is formed. The oxynitrile can be isolated from the higher-boiling fraction by crystallization. The pure, unsaturated nitrile was obtained by dehydration of the nitrile mixture with potassium bisulfate. The solvent used influences the course of reaction. In the case of the reaction of bromoacetonitrile with acetophenone, it was found that in benzene, toluene and in a mixture of benzene and ether mainly resinous products are formed; in dioxane, ether and their

Card 1/2

mixture the maximum yields are 38.5%; the best yields (67.8%) were obtained when using tetrahydrofuran (Table 1). The nitriles not described in publications, with the exception of 5-oxy-5-cyanomethylnonane, were converted into the corresponding amides and, besides, the nitrile of the β-methyl-cinnamic acid was converted into the β-methyl-cinnamic acid. Thus, the nitriles of the β-methyl-cinnamic-, β-oxy-β-phenyl-butyric-, and β-oxy-β-butyl-heptanic acid were synthesized. The results of the experiments are given in table 2, the characteristic features of the amides in table 3. There are 3 tables and 3 references, 2 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley (Scientific Research Institute for Organic Semi-products and Dyes)

SUBMITTED: July 11, 1958

3(3) SOV/79-29-8-54/81

AUTHORS: Vul'fson, N. S., Vinograd, L. Kh.

TITLE: Reformatskiy's Reaction With α-Halogen Nitriles. V. Reaction of Benzaldehyde and Acetophenone With Chloroaceto-, α-Bromopropio-, and α-Bromoisobutyro Nitriles

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 8, pp 2692-2695 (USSR)

ABSTRACT: The authors tried to extend Reformatskiy's reaction with bromoacetonitrile described previously (Ref 1) to other α-halogen nitriles: to chloroacetonitrile, α-bromopropionitrile, and α-bromoisobutyronitrile. All these nitriles were allowed to react with benzaldehyde and acetophenone. In analogy with the reactions of chloroacetate, the chloroacetonitrile reacts more difficultly than the corresponding bromide, as was expected, and gives smaller yields in β-oxynitriles. The α-methyl derivatives of bromoacetonitrile (α-bromopropionitrile and α-bromoisobutyronitrile) react more readily than bromoacetonitrile and give better yields than the corresponding β-oxynitriles. The nitriles were identified, as previously (Ref 1), by transformation into the corresponding β-oxyamides. Yet, not all nitriles reacted in this way. The reaction time of α-methyl- and α,α-dimethyl-β-oxy-β-phenylpropionitrile with H_2O_2 had to be prolonged to 3 hours, and that of

Card 1/2

Reformatskiy's Reaction With α-Halogen Nitriles. V. SOV/79-29-8-54/81
Reaction of Benzaldehyde and Acetophenone With Chloroaceto-, α-Bromopropio-, and α-Bromoisobutyro Nitriles

α-methyl- and α,α-dimethyl-β-oxy-β-phenylbutyronitrile to 6 hours. Only the first three nitriles gave the corresponding amides in small yields. In the case of α,α-dimethyl-β-oxy-β-phenylbutyronitrile, even a splitting-up of the carbon chain takes place, and acetophenone is formed again. On hydrolysis of nitriles (boiling with KOH for 12-15 hours) surprisingly no cinnamic acids resulted. This can be explained by the influence exerted by the α-substituents upon the stability of the carbon chain. The experimental results are given in two tables. There are 2 tables and 11 references, 3 of which are Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley (Scientific Research Institute for Organic Semi-products and Dyes)

SUBMITTED: July 11, 1958

Card 2/2

5(3).
AUTHORS: Vul'fson, N. S., Zaretskiy, V. I. SOV/79-29-8-64/81

TITLE: Investigations in the Field of the Dickmann Ring Formation. VII. Regrouping of 2-methyl-2-carbethoxycyclohexanone Forming 6-methyl-2-carbethoxycyclohexanone

PERIODICAL: Zhurnal obshchey khimii, 1959, Vol 29, Nr 8, pp 2737-2738 (USSR)

ABSTRACT: Since the publications confine themselves (Refs 1-5) to the description of the regrouping of the 2-carbethoxyalkyl derivatives of the 2-carbethoxycyclohexanone, it was interesting for the authors to investigate the analogous regrouping of the 2-alkyl derivative starting from 2-methyl-2-carbethoxycyclohexanone (I). As it is known, the diethyl-α-methylpimelinate (Ref 6) the cyclization of which in boiling benzene in the presence of powdered sodium according to Dickmann yields, as previously reported (Ref 7), the compound (II), is easily formed when compound (I) is boiled in an alcohol solution of sodium ethylate (0,2 mol). However, under usual conditions diethyl-α-methyl-pimelinate (40%), the unchanged β-keto ester (I) (20%), and traces only of the β-keto ester (II) were obtained, whereas the boiling of 2-methyl-2-carbethoxycyclohexanone in xylene in the

Card 1/2

presence of sodium ethylate yields the regrouping forming compound (II) with a 42% yield (Scheme). It was found that diethyl-α-methylpimelinate does not cyclize in the alcohol solution of sodium ethylate, while its ring formation in boiling xylene in the presence of sodium ethylate proceeds smoothly and yields the compound (II) (54%). These facts as well as the formation of a large amount of α-methylpimelinate in the course of the attempt to carry out the regrouping of (I) in an alcohol medium which failed are convincing proof that the regrouping of (I) into the analogous 2,6-compound takes place by an opening of the ring and subsequent cyclization of the resulting diethyl-α-methylpimelinate. There are 8 references, 1 of which is Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley imeni K. Ye. Voroshilova (Scientific Research Institute of Organic Semi-finished Products and Dyes imeni K. Ye. Voroshilov)

SUBMITTED: July 4, 1958

WULFSON, N.S.

PHASE I BOOK EXPLOITATION SOV/1350

Sovetshchaniye po khimii, tekhnologii i primeneniyu proizvodnykh piridina i khinolina. Riga, 1957

Khimiya, tekhnologiya i primeneniye proizvodnykh piridina i khinolina; materialy sovetshchaniya (Chemistry, Technology and Utilization of Pyridine and Quinoline Derivatives; Materials of the Conference) Riga, Izd-vo AN Latviyskoy SSR, 1960. 399 p. Errata slip inserted. 1,000 copies printed.

Sponsoring Agencies: Akademiya nauk Latviyskoy SSR. Institut khimii; Vsesoyuznoye khimicheskoye obshchestvo.

Ed.: S. Reshanova; Tech. Ed.: A. Klyavinya; Editorial Board: Yu. A. Bankovskiy, Candidate of Chemistry; E. V. Vanag, Candidate of Chemistry (Resp. Ed.); L. F. Lilvayev, Doctor of Chemistry, and K. N. Kalnyn'.

PURPOSE: This book is intended for organic chemists and chemical engineers.

COVERAGE: The collection contains 33 articles on methods of synthesizing or producing pyridine, quinoline, and their derivatives from natural sources. No personalities are mentioned. Figures, tables, and references accompany the articles.

Voronetskiy, L. P. and S. L. Kitsenberg (Moskovskiy khimiko-tekhnologicheskiy institut imeni D. I. Mendeleyeva) [Moscow Institute for Chemical Technology imeni D. I. Mendeleyev]. Some Reactions of 3-Hydroxy- 1,2,3,4,-tetrahydroquinolines 229

Pilipchuk, G. S. (Chernovitskiy gosudarstvennyy universitet) [Chernovtsy State University]. The Interaction of N-Arylquinaldine Quaternary Salts With Diazo Compounds 237

Vul'fson, N. S., L. I. Zakharkin, and S. L. Davydova. [Institut elementoorganicheskikh soyedineniy AN SSSR] [Institute of Elementoorganic Compounds, Academy of Sciences USSR]. Products and Byte Ministry of the Chemical Industry, USSR]. Organometal and Organosilyl Derivatives of Some Nitrogen-Containing Heterocyclic Compounds 243

IV. THE USE OF DERIVATIVES OF THE QUINOLINE SERIES IN ANALYTICAL CHEMISTRY

Tikhonova, Ye. S. [Leningradskiy sel'skokhozyaystvennyy institut (Leningrad Agricultural Institute)]. The Use of 8-Hydroxyquinoline in Chemical Analysis 253

Bankovskiy, Yu. A., A. F. Lapsiņš, and V. L. Rumenkov (Chemical Institute of the Academy of Sciences Latvian SSR). 8-Mercaptoquinoline (Thiooxine) as an Analytical Reagent 271

Mikhaylov, O. I. (All-Union Scientific Research Institute for Chemical Reagents). Studies in the Synthesis of 1,10-Phenanthroline 283

Babko, A. K., and M. M. Tananayko (Kiyevskiy gosudarstvennyy universitet imeni T. G. Shevchenko)]. Study of Complex Formation in the System: Metal Ion – Rhodanide (Iodide) – Organic Base 289

V.L'vov, I.S.; ZHUKH, K.S.

Synthesis of 3-acyl-4-hydroxy-carbostyrils. Zhur. VKHO 5 no. 3:352-353 '60. (MIRA 14:2)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley imeni K.Ye. Voroshilova.
(Carbostyril)

ZHURIN, R.B.; VUL'FSON, N.S.

Reaction of C-acyla ion of heterocyclic ketoenols. Part 2: Synthesis of α-acetyl- and α-propionyl-γ-phenyltetronic acids. Zhur.ob.khim. 30 no.8:2467-2468 Ag '60. (MIRA 13:8)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley imeni K.Ye.Voroshilova.
(Tetronic acid)

KOLCHIN, V.Ye.; VUL'FSON, N.S.

Derivatives of acylacetic esters of the heterocyclic series. Part 2: Arylides of α- and β-furoylacetic acids, and synthesis of azomethine dyes from them. Zhur. ob. khim. 30 no.9:3091-3095 S '60. (MIRA 13:9)

(Furanpropionic acid) (Dyes and dyeing)

VUL'FSON, N.S.

Investigation in the series of derivatives of acetonitrile. Report No. 3: Synthesis of substituted ω -cyanoacetophenones. Org. polu-prod. i kras. no.2:128-136 '61. (MIRA 14:11)
(Acetophenone) (Acetonitrile)

VUL'FSON, N.S.; IODKO, M.O.

Synthesis of β-tetralone. Org. poluprod. i kras. no.2:143-145 '61. (MIRA 14:11)

(Naphthalenone)

VUL'FSON, N.S.; ZHURIN, R.B.

Cyclization of phenylhydrazones of 3-acyl-4-hydroxycoumarins. Zhur. VKHO 6 no.2:239-240 '61. (MIRA 14:3)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley imeni K. Ye. Voroshilova.

(Hydrazones) (Coumarin)

VUL'FSON, N.S.; KOLCHIN, V.Ye.

Derivatives of acylacetic esters of the heterocyclic series. Part 3: Synthesis of α- and β-thenoyl acetic esters and arylides, and of azomethine dyes based on them. Zhur.ob.khim. 30 no.10:3425-3430 O '60. (MIRA 14:4)

1. Nauchno-issledovatel'skiy institut organicheskikh poluporduktov i krasiteley.
(Dyes and dyeing) (Thiophenecarboxylic acid)

VUL'FSON, N.S.; ZHURIN, R.B.

Reactions of C-acylation of heterocyclic keto-enols. Part 4: 5-Acylbarbituric acids. Zhur. ob. khim. 31 no.1:281-283 Ja '61. (MIRA 14:1)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley.

(Barbituric acid)

ZARETSKIY, V.I.; VUL'FSON, N. S.

Dieckman reactions. Part 8: Cyclization of the diethyl ester of α-ethyl-α-carbethoxypimelic acid. Zhur. ob. khim. 31 no. 2:484-490 F '61. (MIRA 14:2)

1. Institut khimii prirodnykh soyedineniy AN SSSR.
(Heptanedioic acid) (Cyclization)

ZHURIN, R.B.; VUL'FSON, N.S.

C-Acylation of heterocyclic ketoenols. Part 5: Mechanism of the C-acylation of 4-hydroxycoumarin. Zhur. ob. khim. 31 no.3:875-879 Mr '61. (MIRA 14:3)

1. Institut organicheskikh poluproiuktov i krasiteley imeni K. Ye. Voroshilova.
(Coumarin) (Acylation)

VUL'FSON, N.S.; ZHURIN, R.B.

C-acylation of heterocyclic keto enols. Part 6: Cyclization of phenylhydrazones of 3-acyl-4-hydroxycoumarins. Zhur.ob.khim. 31 no.10:3381-3385 O '61. (MIRA 14:10)

1. Institut organicheskikh poluproduktov i krasiteley imeni K.Ye.Voroshilova.
(Coumarin) (Hydrazones)

VUL'FSON, N.S.

10

SEVERIN, Sergey Yevgen'yevich, Institute of Pharmacology and Chemotherapy, Academy of Medical Sciences, Moscow; VUL'FSON, N. S. [possibly P.L. VUL'FSON, Chair, Animal Biochemistry, Moscow State University (1959 position)]- "The importance of karnosis in neurotrophic relations" Session I

Probably N.M!

SHAMARINA, N. N., Physiological Laboratory, Academy of Sciences USSR, Moscow - "Effect of tetanic stimulation on different muscle fibers" II-2-b

STUDITSKIY, Aleksandr Nikolayevich, ZHENEVSKAYA, R. P., and RUMYANTSEVA, O.N., all of the Institute of Animal Morphology imeni A. N. Severtsov, Academy of Sciences USSR, Moscow - "Neurotrophic influence in recovery of structure and function of regenerating muscle" I

TELEPNEVA, V. I., Chair, Animal Biochemistry, Moscow State University, Moscow - "Changes in muscle following denervation" Session II-2-a

YAKOVLEV, N. N., KRASNOVA, A. F., and CHAGOVETS, N.R., all of the Leningrad Scientific Research Institute, Institute of Physical Culture, Leningrad - "Adaptation of energy metabolism in muscle" Session II-2-b

report to be submitted for the Symposium on the Effects of Use and Disuse on Neuromuscular Functions (IUPS), Prague-Liblice, Czech, 18-24 Sep 1962.

VUL'FSON, N.S.; ZARETSKIY, V.I.; DOMANINA, O.N.

Synthesis of ethyl-β-carbethoxyethyl ester of malonic acid. Zhur. VKHO 7 no.6:709 '62. (MIRA 15:12)

1. Institut khimii prirodnykh soyedineniy AN SSSR.
(Malonic acid)

VUL'FSON, N.S.; ZHURIN, R.B.

Reaction of cycloacylation of heterocyclic keto-enols. Part 7: Cyclization of phenyl-hydrazones of 3-acyl-4-hydroxycarbostyrils. Zhur.ob.khim. 32 no.3:991-994 Mr '62. (MIRA 15:3)

1. Institut organicheskikh poluproduktov i krasiteley i Institut khimii prirodnykh soyedineniy AN SSSR.
(Hydrazones) (Carbostyrils) (Cyclization)

VUL'FSON, N.S.; PODREZOVA, T.N.

Dieckmann condensation. Part 9: Cyclization of ethyl ester of o-(carbethoxymethoxy) phenylacetic acid. Zhur.ob.khim. 32 no.9:3019-3022 S '62. (MIRA 15:9)

1. Institut khimii prirodnykh soyedineniy AN SSSR i Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley.
(Acetic acid) (Dieckmann condensation)

VUL'FSON, N.S.; KOLCHIN, V.Ye.; ARTEMCHIK, L.K.

Derivatives of acylacetic esters of the heterocyclic series. Part 4: Synthesis of nicotinoylacetic ester, arylides, and azomethine dyes prepared from them. Zhur.ob.khim. 32 no.10:3382-3386 O '62. (MIRA 15:11)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley i Institut khimii prirodnykh soyedineniy AN SSSR.

(Pyridinepropionic acid)
(Dyes and dyeing) (Schiff bases)